

### Summary

**Unit One** addressed the big picture of labor market realities—which industries are growing, which are shrinking, and technology’s impact on the market. They learned about the different types of employers in Transportation and Warehousing and read about current issues that affect workers.

**Unit Two** addressed the inner workings of the job-seeker. What are her interests and passions? What kind of work environment will she enjoy? What careers should she consider based on what she knows about herself, and what factors might influence someone making a career change? Students also learned to navigate career database websites, assess their own interests and conduct a group research project about careers in the Transportation and Warehousing sector.

In **Unit Three**, students consider what it takes to prepare for a career in Transportation and Warehousing. They learn about common career pathways and consider how career movement happens in this sector. They learn about the training and educational opportunities available to someone interested in this field.

## 1 • A TRANSPORTATION AND WAREHOUSING CAREER MOVEMENT SERIES

Students learn about how career movement happens in the Transportation and Warehousing sector by reading a personal career narrative and considering their own career trajectories and values.

### 1.1 • Pam’s Career Movement Letter

Students read and discuss a letter about career movement from a young professional in Supply Chain Management. They learn about the various steps she took to find the ideal career for her passion.

### 1.2 • Pam’s Career Map

Drawing on their experiences with map-reading, students consider the trajectory Pam took and portray it as a map. They focus on the steps she took to move from one job to another.

### **1.3 • Multiple Paths: How Personal Factors Impact Career Movement**

Delving more deeply into career pathways, students discuss the personal life factors that cause a worker to choose one path over another, considering their own goals and limitations.

### **1.4 • Transitions in Writing**

Students review the role of transitions in writing and practice identifying the correct transitions for sentence pairs based on Pam's Career Movement Letter.

## **2 • TRANSPORTATION AND WAREHOUSING JOB TRAINING SERIES**

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Students learn about job training programs—what they are, how to find a good one, what to expect as a participant, and research high-quality Job Training programs in Transportation and Warehousing.

### **2.1 • Job-seeker Terminology**

Students learn vocabulary relevant to a job search in any sector, by matching job search terms to their definitions.

### **2.2 • Know Before You Enroll**

Students read a tip sheet and discuss advice about how to find a reputable job training program. They then write letters of advice to friends or family members who might want to enroll in a training program.

### **2.3 • Developing Questions: Job Training Programs in Transportation and Warehousing\***

Students develop questions to ask before applying to job training programs, and use them to research training programs for entry-level Transportation and Warehousing jobs.

## **3 • A TASTE OF TRAINING: READING AN EMPLOYEE SAFETY MANUAL**

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Reading an informational text

Students practice note-taking while learning about a trucking company's safety regulations by reading their employee's safety manual. After reading the manual, they assess their note-taking skills by taking a quiz using their notes.

## **4 • PROBLEM-SOLVING IN TRANSPORTATION AND WAREHOUSING: PACKING A SHIPPING CONTAINER**

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- Estimation
- Geometry
- Volume
- Using Math to Support a Claim

Students work in groups to solve a real-world math problem of determining how to arrange boxes in a shipping container to fit the maximum number of boxes.

## 5. CUNY CAN GET YOU THERE SERIES: CUNY PROGRAMS IN TRANSPORTATION AND WAREHOUSING

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Students get an overview of CUNY Transportation and Warehousing certificate and degree programs and practice using resources to research them, including CUNY college websites.

### 5.1 • Researching CUNY Degree and Certificate Programs in Transportation and Warehousing\*

Students practice using a college website to locate degree and certificate programs in Transportation and Warehousing, then choose one degree program to research in further detail.

### 5.2 • Understanding CUNY Degree Program Requirements\*

Students read a description of a sample Transportation and Warehousing major and identify the roles of various general education requirements within the overall course of study.

### 5.3 • CUNY Certificate: Automotive Technician at Bronx Community College

Students read a description of a Transportation and Warehousing certificate offered at a CUNY campus, and develop questions based on what they read.

### 5.4 • How Do I Enroll in CUNY?\*

Students learn the steps required to apply to CUNY certificate and degree programs.



\*RAENs will provide regional adaptations.

## Transportation and Warehousing Career Movement Series

Students learn about how career movement happens in the Transportation and Warehousing sector by reading a personal narrative and considering their own trajectories and values.

### ACTIVITIES IN THIS SERIES

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**1.1 • Pam's Career Movement Letter**

**1.2 • Pam's Career Map**

**1.3 • Multiple Paths: How Personal Factors Impact Career Movement**

**1.4 • Transitions in Writing**

# Pam's Career Movement Letter



60 MINUTES

Students read and discuss a letter from Pam, a young professional in Supply Chain Management, as she describes the path she took to arrive her current career. They track her education and career movements and consider the steps she took to progress at each stage of her career.

## PREP

- Read *Pam's Career Movement Letter*

## MATERIALS

- *Pam's Career Movement Letter*

## EXPLAIN

- 1 Have you ever needed to make a big decision in your life, but you didn't know how to go about deciding what to do? What was it and what steps did you take to figure it out?
- 2 Pam is a young adult who had always wanted a career that was practical and hands-on. She took many steps to discover and land her dream job, and faced many challenges along the way.
- 3 Distribute *Pam's Career Movement Letter* and ask students to read it. While they are reading, write the following questions on the board.

- a) Why did Pam decide to pursue her high school equivalency diploma?
- b) What steps did Pam have to take in order to get into college?
- c) How did Pam figure out what she should major in?
- d) Why did Pam choose to attend BMCC instead of another CUNY schools?
- e) What challenges did Pam face during her internship?
- f) What message do you think Pam wants to share in this letter?

- 4 When students are finished, ask them to discuss the questions in pairs.



## Pam's Career Movement Letter

When I think back on it, it makes a lot of sense that I would end up in my current job. I was born and raised on Staten Island where I attended high school. The teachers were OK, but I could never get excited about different types of triangles or random facts in history class. Don't get me wrong—I like to learn, but I wanted practical, hands-on knowledge about how to make or do things, and the best ways to do them.

Growing up, my family used to volunteer during Thanksgiving week for a YMCA donation drive. It was kind of a tradition for us. Families in need sent in a list of things they needed, and we tried to fulfill their requests with the donations dropped off at the YMCA. First, we sorted them by type—like food or toys or toiletries—then we created boxes together for the families and delivered them. There were over a hundred families on the list, so it was a big undertaking. One year, I think I was a sophomore, I came up with a faster way to sort the donations and figured out a delivery system where each driver focused on one area of town, reducing the total number of trips needed. The people running the program didn't really understand why a random teen like me was obsessing over the details, but they liked the results!



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That's when I started to consider a career in handling and transporting products. In some sense, I was following in my dad's footsteps, minus the truck. He was a regional truck driver for most of his life, hauling finished consumer products, like clothes or furniture, and perishables, such as vegetables or frozen dinners. It was good work, but he wasn't home a lot and he said being on the road could get lonely. I knew trucking wasn't for me, so I started exploring other options.

A friend of my dad had heard that a few warehouses near the Marine Terminal in New Jersey were hiring for the summer, and possibly for longer. So after I finished my junior year, I got a job as a warehouse laborer doing different tasks around the warehouse. At first my co-workers seemed uncomfortable around me because I was the only woman working the warehouse floor, and I was younger than most. But once they saw that I was carrying my own weight and doing some tasks better than anyone, they got over it.

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When summer ended, I decided to keep working, even though my dad tried to convince me to finish high school first. A few months later, I was trained to operate a forklift and got my certification. I worked as a forklift operator for about a year and got better and faster at moving shipments around the warehouse, even the tricky corner spots. My co-workers gave me the nickname “Precision Pam.”

That first year was a good experience because I felt really supported by my supervisor. He even put into practice my idea for receiving shipments in a way that used the warehouse space more efficiently. But when he left for a different job and we got a new supervisor, things got difficult pretty quickly. The new supervisor would always find fault with how I did things, even if I did the job perfectly, and in general, kept finding small ways to exclude me from the team. I expressed my concerns, but he kept brushing me off, saying things like, “Not right now, missy.” It was really frustrating because my co-workers respected me, but my boss clearly didn’t.

I talked to my dad about it, and he said this might be a good time to go back and get my high school diploma. I don’t think I would’ve considered it if I wasn’t having problems at work, but once he mentioned it, I realized that I was up for a bigger challenge and that I should explore other paths to do the kinds of things I felt passionate about.

I signed up for High School Equivalency (HSE) classes at the College of Staten Island (CSI). Then I switched to a part-time schedule at work to have time to study. Even though I reduced my hours at work, I had a hard time switching between work-mode and being in the classroom every day; plus, I didn’t like having to do homework again! But I knew having my HSE diploma would open doors for me, so I pushed through.

When I finally took the TASC exam, I did fine on the Math, Science and Social Studies, and passed Writing and Reading by just one point. I couldn’t believe I passed the TASC the first time I took it—I was so happy. But I still felt unsure of myself when it came to reading and writing. So when I applied to CUNY and took the assessment exams, I wasn’t surprised to learn that I needed remedial work in reading and writing. At this point, I wasn’t 100% sure if college was right for me, but my teacher said I was a good student—gasp!—and that some college could go a long way in the field I was interested in. She told me about a program at CSI (and many other CUNY schools)





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called CUNY Start that could help me take care of remedial needs for very little money. I thought, why not?

CUNY Start turned out to be a very good thing for me because, in addition to writing and reading, it also taught us about career exploration. After a lot of time researching online and asking my advisor for help, I came across something that sounded like a perfect fit for me called Supply Chain Management (SCM), a subject usually taught as part of a business major.

How can I describe it? It's like seeing how the world of things is connected. For example, to get a product in your hands, someone had to gather the materials, make the thing, send it, store it, and deliver it to the store where you picked it up. My warehouse job was just one piece of a large moving puzzle. Supply Chain Management makes sure the right amount of the right materials gets to the right place at the right time—I wanted nothing more than to do this for a living!

After I took care of my remedial needs, I decided to do my general education requirements at BMCC because they had articulation agreements with Rutgers University, which has a great Supply Chain Management program. When I started my first semester of classes at BMCC, I had to quit the warehouse because I was too busy with the commute from Staten Island to the city and all the school work. After I got my Associate's degree, I transferred to Rutgers University for my last two years and majored in Supply Chain Management in the Rutgers Business School.

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My last year there, I got an internship at a mid-sized company where I sometimes got to participate in meetings with other SCM personnel. I was learning so much every day, and after I stopped feeling intimidated, I started to participate in the team meetings, making observations and suggestions. Overall, I think they were impressed because they offered me a position as a Supply Chain Analyst a few months before I graduated!

I have to admit, though, that I felt restless as an intern because I had to spend so much time in front of a computer—as nearly all this type of work requires computer use. And to tell you the truth, I felt uncomfortable using this state-of-the-art software because I didn't totally understand how it worked. But I was told that as a Supply Chain Analyst I'd do some travel and have more variety in my work day. And it's true.

Although I haven't seen the inside of a warehouse for several years now and sometimes miss zipping around in my forklift, I've been able geek out about increasing the efficiency of the supply chains we work with; I also traveled to Brazil and China. I got to visit a warehouse during one of these visits, and it was great to return to where I started my career. It's the greatest satisfaction to know you've organized a system as efficiently as possible—a system to move items from A to B as quickly and inexpensively as possible. Basically, every day of work is like solving a giant puzzle. I love it.

My advice to people who want to enter this sector, or any sector, is you may know what you like and are good at, but not think there's a job for you out there—but trust me, there is. You might not have heard of it, but if you research, you might just find the perfect fit like I did. •

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60 MINUTES

## Pam's Career Map

Drawing on their experiences with map-reading, students consider the trajectory Pam took and portray it as a map. They focus on the steps she took to become a Supply Chain Analyst.

### VOCABULARY

key  
legend  
symbol  
feature

### PREP

- Be prepared to define the terms: **key, legend, symbol, feature.**
- Draw a Career Map based on Pam's letter.

### MATERIALS

- Chart paper and markers
- Teacher's map of Pam's Career Movement

### DISCUSSION

**Ask:** What is a map?

› *A visual representation of a geographic location.*

How is it used?

› *For navigation. To learn how to travel between points, or how to find where you are, if you're lost.*

Some maps have a key or legend. What does a key on a map usually tell you?

› *It includes symbols that correspond to various types of landmarks, on the map such as medical facilities and religious buildings.*

Why is this important?

› *It locates the landmark and identifies its purpose.*

Have you ever used a NYC\* subway map? What are some of the features and symbols on it and what do they represent?

› *Example: Different colored lines, representing subway lines, squares for terminal stations, open circles and closed circles for express and local stops, dotted lines for subway tracks currently under construction.*

Have you ever used another kind of map? What kind? What was easy or difficult about using it? What are some symbols you might find on a map?

› *Straight lines, dotted lines, triangles, circles, icons, for example, of mountains or restaurants.*



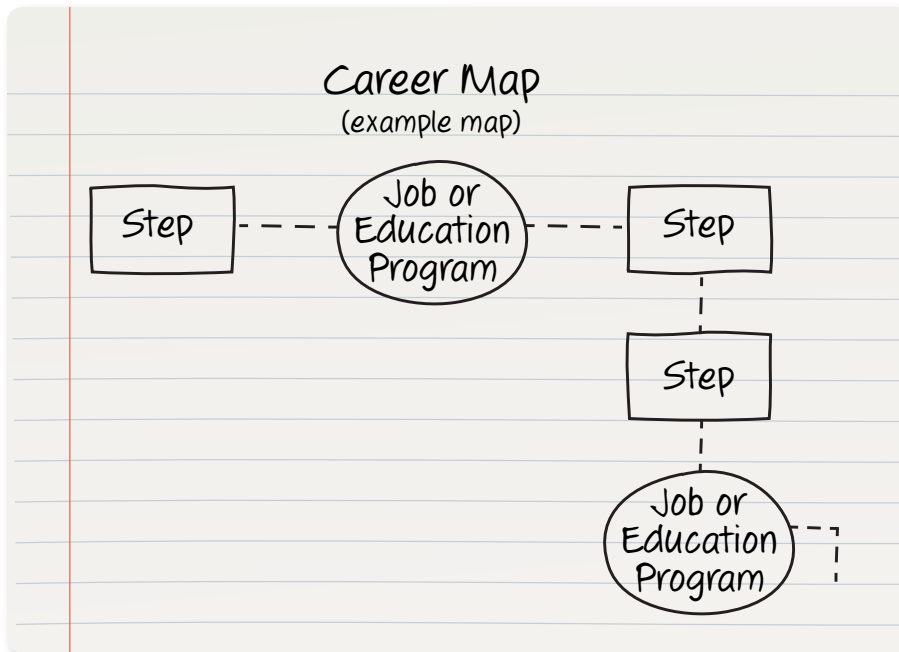
\*RAENs will provide regional adaptations.

## Draw Pam's Career Map

Divide students into groups to draw Pam's career map. Distribute the paper and markers to each group.



### DISCUSS INSTRUCTIONS

- 1 Take out one piece of paper for the group. Before you draw the map, list the different places Pam either studied at or worked in order. Next to each place, list anything Pam did to help her move forward in her career.
  - *Example: Talking to others to learn more or researching her interests in class.*
- 2 On a separate piece of paper, draw a map as follows:
  - Write the places she studied or worked and draw a circle around each one.
  - Write the steps Pam took to get to each point on her career path and draw a box around each step.
  - Draw dotted lines connecting the places and actions showing an order of progression.



- 3 Draw a legend or key, explaining what the circles, boxes and dotted lines mean.

#### KEY:

-  = Step
-  = Job or Education Program
- = Time spent before taking the next action



45 MINUTES

## Multiple Paths: How Personal Factors Impact Career Movement

Students consider what goes into choosing a career path. What would make someone interested in Transportation and Warehousing become an Automotive Mechanic as opposed to a Traffic Engineer? And in general, what personal factors impact how a worker will change careers?

### DISCUSS

What life factors affect whether someone stays at an entry-level career in Transportation and Warehousing, or pursues higher-level careers that require advanced degrees?

What life factors might play a role in the pathway workers take?

Write answers on the board.

- **Their interests.** *for example an interest in working face-to-face with commuters or working with technical equipment.*
- **Their time.** *A career change might require a lot of education, which they might, or might not have.*
- **Family.** *They might need to spend more or less time taking care of family members.*
- **Money.** *They might have to invest a good deal of money into their education.*
- **Limitations.** *They might find a particular career is too difficult physically.*
- **Career exploration.** *They might try a few different careers before they find one that is a good fit.*

Write the following questions on the board. Put students into pairs and have them discuss the questions.

*How does family impact your career choice?*

*How does time impact your career choice?*

*How does money impact your career choice?*

*How does interest or personality impact your career choice?*

*What else impacts your career choice?*

# Transitions in Context



45 MINUTES

Students review the role of transitions in writing and practice identifying the best transitions for sentence pairs based on Pam's Career Movement Letter.

## PREP

- Review Pam's career story as well as the transition materials.  
NOTE: the first lesson in this series should be done prior to this lesson.
- Students should already be familiar with or teacher should be prepared to introduce what transitions are and how to use them.
- Transitions are words and short phrases used to connect ideas in writing and in speech. They can help clarify the relationship between sentences and paragraphs to show, for example, chronology or cause and effect.

## MATERIALS

- *Pam's Career Movement Letter* (extra copies in case some students are missing theirs)
- *List of Transitions* handout
- *Using Transitions in Context* handout

## EXPLAIN

- 1 Today we will be working with transition words. **What are transitions? What role do transitions play in writing and in speech?** Record student responses on one part of the board.
  - *They connect ideas, signal that you are starting or ending, they make your writing smoother, they help the reader follow an essay or story.*

NOTE: If students struggle to provide a definition, move onto Step 2 and review examples of transitions. Then redirect students to Step 1 by asking:

- What do these transitions all have in common?
  - Do these transitions help us express ourselves better?
  - If so, how?
- 2 What are examples of transition words? Record student responses on another part of the board. Students should take notes.
    - *However, therefore, also, then, in other words, to conclude, first, second, lastly, afterward, as a result, yet, on the other hand.*

- 3 When it comes to writing, where do we use transitions words? Add these responses to a different part of the board.
  - *Between sentences, between paragraphs, at the start, middle, and end of an essay, when introducing examples, when moving from a quote to a paraphrase, when giving directions, when describing a sequence of events, to end a paper.*
- 4 Today we will practice using transitions to clarify the relationship between sentences. Distribute the *List of Transitions* handout. In pairs, students read through the list of transitions, circling ones that are unfamiliar. As a class, review and provide example sentences for any transitions that are unfamiliar or confusing to students. NOTE: *this is not an exhaustive list and students should add additional examples as they encounter them.*
- 5 Distribute the *Using Transitions in Context* handout. The sentence pairs are based on Pam's story, so take out your copy of *Pam's Career Movement Letter* to use, along with the *List of Transitions*, as a reference.
- 6 Review the first two examples on the handout with students. In partners or groups of four, students should complete the handout.
- 7 Review answers as a class, noting that different transition words (from the same category) can work for the same sentence pair. Note also that only certain categories of transitions were used in this activity, and that students will have the opportunity later to practice other categories of transitions.



## List of Transitions

**TRANSITIONS** can be used to make connections between ideas, to clarify the logic of a text, and to help a reader follow the writer's thinking. Each type of transition indicates a particular relationship between ideas, including sequence (the order in which events happen), causation (one event that caused another event to happen) and others..

Transitions can be used between sentences, between paragraphs, at the start, middle, and end of an essay, when introducing examples, when moving from a quote to a paraphrase, when giving directions, when describing a sequence of events, to end a paper, and more.

### Addition, similarity

in addition, furthermore, also, moreover, similarly, likewise, equally important, in fact

### Consequence (cause and effect)

as a result, accordingly, therefore, consequently, for this reason, in this way, due to this fact

### Contrast

however, yet, in contrast, on the contrary, on one hand/on the other hand, instead, rather, although, in fact

### Sequence

first of all, to begin with, next, then, soon, later on, meanwhile, earlier, later, simultaneously, afterward, lastly

### Paraphrase, restate

in other words, that is, that is to say, in essence, to summarize, in short

### Generalize

in general, generally speaking, generally, for the most part, as a rule

### Conclude

In conclusion, on the whole, to sum up, overall, finally, in the final analysis, all in all

## Using Transitions in Context

Read each pair of sentences below. Return to Pam's story and find where the event occurs in the text and underline it. Use the hint after the sentence pair to select a transition from the List of Transitions to connect the sentences in a way that will help the reader understand the connection between the two. Then rewrite the sentence pair using the transition.

- EX. 1** The weather forecast predicted a thunderstorm in the afternoon.  
I brought an umbrella to work. (CONSEQUENCE)

The weather forecast predicted a thunderstorm in the afternoon.

Therefore, I brought an umbrella to work.

- EX. 2** At the zoo, I saw two tigers and a baby elephant.  
I saw a giant millipede and some gorillas. (ADDITION)

At the zoo, I saw two tigers and a baby elephant. Also, I saw a giant  
millipede and some gorillas.

- 1** During a donation drive over Thanksgiving, Pam came up with a way to sort the items efficiently.  
She figured out a delivery system that reduced the total number of trips needed. (ADDITION)

- 2** Pam was a very careful and efficient forklift operator. Her co-workers gave her the nickname  
"Precision Pam." (CONSEQUENCE)

- 3** Pam had a good experience during her first year at the warehouse. Much changed when  
the new supervisor came on board. (CONTRAST)



- 4 On one hand, Pam disliked having to do homework again. Pam was motivated to get her High School Equivalency diploma. (CONTRAST)

- 5 Pam's test scores for Writing and Reading were not high enough to enroll in credit classes at CUNY. She attended CUNY Start to take care of her remedial needs. (CONSEQUENCE)

- 6 Pam worked on her Associate's degree at BMCC. She transferred to Rutgers University to attend their Business School. (SEQUENCE)

- 7 Pam likes Supply Chain Management because it involves complex organizational skills. She enjoys it because it allows her to use her problem-solving skills. (ADDITION)

- 8 During Pam's internship, she had to sit in front of a computer for much of the day. Her job as Assistant Supply Chain Analyst includes a variety of activities, including international travel! (CONTRAST)

## Transportation and Warehousing Job Training Series

Students learn about job training programs—what they are, how to find a good one, what to expect as a participant, and research high-quality Job Training programs in the Transportation and Warehousing sector.

### ACTIVITIES IN THIS SERIES

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**2.1 • Job-Seeker Terminology**

**2.2 • Know Before You Enroll**

**2.3 • Developing Questions: Job Training Programs in  
Transportation and Warehousing\***

# Job-Seeker Terminology



45 MINUTES

Students learn vocabulary relevant to a job search in any sector, by matching job search terms to their definitions.

## PREP

Create one index card for each student, containing either a Job-Seeker term or a description of the term. It's okay if some of them repeat.

## EXPLAIN

- 1 Job training programs offer many different services to people looking to improve their skills to find a job. Before learning about training programs, it's important to understand what the various services are.
- 2 Distribute one card to each student, making sure each card has a match, and ask students to find their match.
- 3 Once students find their match, have pairs share their description with the class.
- 4 Discuss definitions as a class.

Job-Seeker Terminology	Definition of Job-Seeker Terminology
<b>Job Training</b>	A program, either fee-based or free, in which participants learn a specific workplace skill, such as refrigerator repair or commercial driving.
<b>Job Placement</b>	A service that assists participants in applying for jobs. It may be part of a job training program or may exist on its own.
<b>Job Readiness</b>	Teaches general workplace skills such as professional dress and communication, how to write a resume and cover letter, how to prepare for an interview, and workplace expectations such as punctuality and cell phone use.
<b>Career Advisement/Coaching</b>	One-on-one meetings to discuss a job-seeker's interests and skills, where to look for jobs and educational opportunities.
<b>Employment Agency or Office</b>	A company, hired by businesses, to interview and hire new employees, and used by job-seekers to find jobs.
<b>Degree</b>	A document earned from a college or university showing completion of coursework in a particular area of study. Usually requires a minimum of 2-3 years.
<b>Certificate</b>	A document earned from a college or university, community based organization, union or private company, showing mastery of a specific job-related skill.
<b>Apprenticeship</b>	"Earn while you learn." This is paid training in a particular job-related skill, often including classroom and supervised work experience. Participants are sometimes hired by the company that trained them and sometimes receive job placement assistance. They are common in the building trades and more recently in the culinary arts.
<b>Pre-Apprenticeship</b>	A program that provides participants with the skills they need to participate in a paid training program, such as literacy and math skills related to the job.
<b>Internship/Field Placement/Practicum</b>	Supervised work experience and workplace-based training often done for school or college credit. It may be accompanied by or part of a class in which training experiences are discussed.
<b>Trainee</b>	A person who is being trained in a particular job. Usually refers to people who are paid for their training.
<b>Probation</b>	A period early in employment during which an employee must demonstrate competency at her job before being considered a permanent employee.



# Know Before You Enroll\*



75 MINUTES

Students learn how to choose a high quality job training program by reading a training program selection tip sheet and using it to write a letter of advice to a young person in their life who is planning to enroll in a job training program.

## PREP

- This activity may be done following the previous activity on terminology for job-seekers, or may be done on its own.
- Read the *Know Before You Enroll* tip sheet.

## MATERIALS

- *Know Before You Enroll* tip sheet
- *Job Training Advice Letter* writing assignment

## EXPLAIN

- 1 The New York City Mayor's Office discovered that many students were graduating from job training programs with a lot of debt and without jobs or useful certifications promised by the programs. They created an ad campaign to help New Yorkers choose high quality training programs that would help them be prepared for and find employment in their field. Although it was created in New York City, much of the advice applies to job training programs anywhere.
- 2 Distribute the *Know Before You Enroll* tip sheet, and ask students to read and annotate it. In particular, they should underline and take notes about:
  - Any tips in the handout that seem like good ideas, or ones that they hadn't thought about before.
  - Anything that is confusing to them.
- 3 Have students share their ideas from the handout in small groups.  
Which were the best ideas from the handout, and why?  
What questions did you have or which parts, if any, seemed confusing?



\*RAENs will provide regional adaptations.

- 4 Tell students that they will now apply what they learned to a writing assignment. It's often good to look back at a reading to check what it says, but it's also good to turn it over and not look at it, to challenge your memory and to make sure you're writing about it in your own words. Tell students to put away their handout to write.
- 5 Distribute the writing assignment and review the directions.
- 6 Before they write, ask students to discuss in pairs the best pieces of advice from the reading (without looking at the reading).
- 7 Once students have written the letters, ask them to re-read the tip sheet and mark any points they remembered incorrectly, or any useful points they did not include. Then revise their letters to include these points, putting all information in their own words.



## Know Before You Enroll Tip Sheet

### THE ISSUE

As the number of enrollees in job training programs grows, there is concern about these schools' high cost and aggressive marketing. For-profit schools widely market their services on subways and buses, TV and radio, and in community and ethnic newspapers, but many students are unaware of the potential implications of enrolling in a for-profit school or of the free and low-cost education and training programs that are available.

“ I saw an ad on TV for a two-year school where I could learn graphic design and threw away \$25,000 on a worthless diploma. My credits don't transfer toward a bachelor's degree, and the school never helped me get the internships and jobs they promised.

Thanks to the City's Financial Empowerment Centers, I'm paying back my loans and saving to go to CUNY.”

— Garvin,  
Brooklyn

**Know Before You Enroll**

Visit **nyc.gov** or **call 311** and ask about free and low-cost education and training options and financial counseling.



Department of Consumer Affairs  
Office of Financial Empowerment  
Jonathan Mintz  
Commissioner

Center for  
Economic Opportunity  
Veronica M. White  
Executive Director

Mayor's Office of  
Adult Education  
Dana Collins  
Executive Director

NYC Service  
Dahyan B. High-Durford  
Chief Service Officer



**"Protect yourMoney"**

[http://www.nyc.gov/html/ohcd/downloads/pdf/garvin\\_english.pdf](http://www.nyc.gov/html/ohcd/downloads/pdf/garvin_english.pdf)

# Know Before You Enroll

Before you take on debt or pay to enroll in a school or training program, do your homework first. Here are 10 important tips to help you protect your money.

1. **Free and low-cost adult education and training options are available.** Visit [nyc.gov](http://nyc.gov) or call 311 and ask about free and low-cost adult education and job training options. You can attend classes at the Department of Education, City University of New York (CUNY), public libraries, community-based organizations, Workforce Career Centers, and more.
2. **If a school or training program sounds too good to be true, it probably is.**
3. **Research, research, research.** Consider multiple schools before deciding which one is right for you. Ask for information on graduation and completion rates, student loan debt, and whether or not the credits you get will transfer to other schools. Sit in on a class, ask to speak to former students who have completed the program, and visit [nyc.gov](http://nyc.gov) to read reviews from real students in the NYC Training Guide. Ask to see a list of employers that hire graduates, and call those businesses to ask their opinion of the school. You should also research the general field you're interested in to make sure it's the right fit and there's potential for job availability and growth.
4. **Avoid unlicensed schools.** Some schools are operating illegally. If you go to an unlicensed school, you can't take exams to become licensed in many fields such as nursing. Visit [nyc.gov](http://nyc.gov) or call the New York State Education Department at (212) 643-4760 or (518) 474-3969 to check if a vocational or trade school is licensed. Remember, even if a school has a license, it might not be well run, so research the school before you sign up. Call 311 or visit [nyc.gov](http://nyc.gov) to file a complaint about an unlicensed school.
5. **Don't sign up the day you visit a school.** Before you sign up, you need to understand how much the program will cost and how you will pay for it. Do not make such an important decision on the spot! Take your time, and research the school. Visit [nyc.gov](http://nyc.gov) for the NYC Training Guide to learn more about specific schools and programs.

6. **Never sign anything you don't understand.** If a school pressures you to sign a contract or agreement on the spot, walk away. You have the right to bring home important forms so you can read them more carefully and review them with people you trust.
7. **Ask for the school's tuition cancellation policy in writing.** The policy should describe how you can get a refund if you need to cancel or withdraw. However, once you have signed up, it can be tough to get your money back.
8. **Be careful of taking on a lot of debt.** Some schools charge tens of thousands of dollars. Often, the "financial aid" that is available isn't free money, but rather loans you have to pay back—with interest. School loans last a long time, and there's a limit on how much money you can borrow. Loans can also lower your credit score if you don't pay them back on time. Make sure you understand the terms and will be able to make the payments. Remember that free and low-cost education and training options are available. See tip #1!
9. **Avoid schools that "guarantee employment" after you graduate.** A school can't guarantee that you'll get a job when you graduate. Many times, the schools that make these types of promises don't actually place you in a job.
10. **You have the right to file a complaint.** Did you enroll in a school or training program but didn't get what you were promised? Call 311 or visit [nyc.gov](http://nyc.gov) to file a complaint.

## Are you in debt from school?

Visit [nyc.gov](http://nyc.gov) or call 311 and ask for an NYC Financial Empowerment Center, where you can get free one-on-one professional financial counseling.



Department of Consumer Affairs  
Office of Financial Empowerment  
Financial Literacy  
Consumer Protection

Center for Economic Opportunity  
Financial Literacy  
Entrepreneur Training

Mayor's Office of Adult Education  
New College  
Financial Literacy

NYC Service  
Career Development  
Child Support Office



"Protect Your Money!"





# Job Training Advice Letter

**Imagine that your nephew/cousin/friend is planning to enroll in a job training program. Write a letter of advice, explaining what they should do to make sure they choose a high quality program that will help them meet their career goals. In your letter, make sure to use and explain the best pieces of advice you learned from the reading. The letter is started for you below.**

Dear \_\_\_\_\_,

I heard that you were planning to enroll in \_\_\_\_\_. I'm excited for you, and I also wanted to offer some advice before you enroll. \_\_\_\_\_

[illegible]





60 MINUTES

## Developing Questions: Job Training Programs in Transportation and Warehousing\*

Students learn about training programs for entry-level Transportation and Warehousing jobs by developing research questions to find out more about the programs, then researching program websites and discussing their findings.

### PREP

- This activity references the previous lesson, *Know Before You Enroll*. It is recommended that all lessons in the series be done sequentially. If you have not done the previous lesson, you may want to incorporate the *Know Before You Enroll* tip sheet into this lesson.

NOTE TO INSTRUCTOR: Transportation and Warehousing generally does not require a degree to enter the field, though for certain jobs a degree may be helpful or necessary for advancement in the field. Many Transportation and Warehousing workers are trained on-site or gain their skills in a credentialed training program. As this sector often involves heavy machinery and vehicles, it is important to earn the required licenses to comply with local and federal safety laws.

### MATERIALS

- Computers are recommended for this activity. If not available, use the job training websites listed in the directions below and print out program information to distribute paper copies to students.
- Developing Research Questions for Job Training Programs* handout
- Job Training Program Research* handout

### EXPLAIN

- One way to prepare to enter the Transportation and Warehousing workforce is a job training program. Why would someone want to do a job training program instead of going to college?
  - It might be less expensive than college, not as much time is required, it prepares participants for a specific job that requires only a short-term training program, job placement may be included.



\*RAENs will provide regional adaptations.



- 2 Today we are going to research job training programs in Transportation and Warehousing.
- 3 Divide the students into groups. Ask groups to brainstorm questions they might ask about a job training program. They should recall some of the job training tips from the previous activity as they develop their questions.
- 4 Once the brainstorms are complete, have students share their lists of questions with the class. Take notes on the board to create a master list of questions, and add questions they may not have thought about.

Some key questions include:

- What are the program requirements?
  - How long is the training program? What is the schedule?
  - What will I learn in the training?
  - What kinds of jobs does the training prepare people for?
  - How much (if anything) does the training program cost?  
Is there any financial aid available?
  - What does the program do to help graduates find jobs?
  - What are the job placement rates for graduates?
- 5 Distribute the *Developing Research Questions for Job Training Programs* handout, and have students write 6 questions from the board that they want answered when they research job training programs.
  - 6 Distribute the *Job Training Programs Research* handout and let students choose from the following websites to research a training program. Write the URLs on the board.
    - **Red Hook on the Road at Brooklyn Workforce Innovations\***  
<https://bwiny.org/red-hook-on-the-road/overview/>
    - **Security Guard Training at HANAC**  
<http://hanac.org/portfolio/employment-education/>  
[Note: the Transportation and Warehousing sector employs security officers at airports, ports, transit hubs and more]
    - **NYC Taxi Limo Training Center**  
<http://www.nyctaxilimotrainingcenter.com>



\*RAENs will provide regional adaptations.

- 7 Ask students to complete the *Job Training Programs Research* handout. Circulate to help students notice which information is and isn't on the website. If computers are not available, distribute paper copies of the job training programs listed above.

### DISCUSS

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- What did you learn from this research about job training programs (about the programs, possible careers, or how to research a training program)?
- What else would you need to do besides look at the website to be fully informed about the training program?
- What qualities make a good job training program?
- Did you learn about a job training program that was interesting to you? Why or why not?

## Developing Research Questions for Job Training Programs

Write six questions you would like answered about your chosen job training program.

1.

2.

3.

4.

5.

6.

## Job Training Program Research

Now that you have researched your chosen job training program, use the *Know Before You Enroll Tips* to try to determine the quality of the program. For each tip in the left column, discuss how your job training program does or does not measure up, citing evidence from the website that led you to make your conclusion.

Job Training Program Name: \_\_\_\_\_

Program Location/Company: \_\_\_\_\_

Know Before You Enroll Tip	How Does My Job Training Program Measure Up?
<b>#1</b> Free and low-cost adult education and training options are available.	
<b>#4</b> Avoid unlicensed schools.	
<b>#7</b> Clear tuition cancellation policy	
<b>#9</b> Avoid schools that “guarantee employment” after you graduate.	

Do you consider your job training program to be of high quality? Why or why not?

What additional questions do you have?

Are you interested in this training? If yes, why? If no, how can this research activity assist you in researching training programs in your field?

# A Taste of Training: Reading an Employee Safety Manual



60 MINUTES

Students practice note-taking while learning about a trucking company's safety regulations by reading their employee safety manual. After reading the manual, they assess their note-taking skills by taking a quiz using their notes.



Reading an informational text

## PREP

- Read the *Brecht Trucking Safety and Compliance Manual*

## MATERIALS

- *Brecht Trucking Safety and Compliance Manual* article
- *Quiz: Safety on the Job*
- *Quiz: Safety on the Job* answer key

## EXPLAIN

### 1 What rules do you have to follow if you are driving a car?

- *You have to wear your seatbelt, follow the speed limit, obey traffic signals, no drinking and driving, no texting while driving.*

Why do these rules exist?

- *To prevent accidents, to protect the driver (and passengers) in case of accidents, to protect pedestrians, to protect other drivers on the road, to stay focused on the road, to prevent dangerous driving conditions.*

In Transportation and Warehousing, similar kinds of rules exist because safety is the top priority. When large vehicles and heavy machinery are in use, it is important for safety guidelines to be in place and enforced. Often the first task for a Transportation and Warehousing worker is to read the safety manual. Employees must demonstrate understanding of the safety regulations before operating any machinery or vehicle.

### 2 Ask if any of the students in the class have worked in a Transportation and Warehousing job. If so, ask them to describe their experiences with the safety expectations and protocols (procedures).

- 3 We're going to read a sample safety manual from a trucking company. As you read, you should underline important parts of the manual. On a blank sheet of paper, write down key concepts, important points, and things you want to remember. You will be able to use these notes to take a quiz on the manual, but you won't be allowed to use the actual manual. Distribute *Brecht Trucking Safety and Compliance Manual*, and have students read and take notes as instructed.
- 4 Ask students to read the safety manual a second time. They should stop reading after each section to make sure they've underlined parts they think are important and to write notes that they can use during the quiz. Remind them not to underline everything, but rather to underline key words and phrases and make notes that summarize the main ideas or interesting points.
- 5 Ask students if they feel prepared to take a quiz about the manual. If not, explain that you will give them time to read the manual one more time. Students should add new information to their notes that they might have missed in the first two readings.
- 6 Ask students to put the reading away, and distribute *Quiz: Safety on the Job*. Ask students to take the quiz. Explain that they should work alone and use their notes to answer the questions.
- 7 Ask students to exchange papers and correct each others' answers using their own notes along with the manual. Ask for volunteers to discuss their answers. A teacher's answer key is included to support the discussion. Ask students to return their partner's paper with corrected answers.

### DISCUSS

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- How was this experience of reading the manual, taking notes, and using the notes for information?
- What was challenging?
- What skills did you use?
- What kinds of information did you catch the second or third time you read the manual that you did not catch the first time?
- How can this activity be applied to other subjects?
- What did you learn about your note-taking?



## Brecht Trucking Safety and Compliance Manual

Adapted from Section 7 ("Safety and Compliance") of *Brecht Trucking Handbook and Safety Handbook* found at <http://www.brechttrucking.com/Portals/0/BRECHT%20TRUCKING%20HANDBOOK%20FOR%20WEBSITE.pdf>

**The operation of Brecht is governed by the rules and regulations of The Department of Transportation. The Brecht management team strongly endorses and enforces the following regulations.**

### Speed Limits

- Brecht's maximum speed limit is 68 miles-per-hour.
- In addition, all state, county, and municipal speed limits will apply.
- Convictions on any speeding tickets will result in the following penalties:
  - First offense:* written warning, insurance probation contract
  - Second offense:* termination
- Speeding tickets of *15 mph or greater* will result in immediate termination.

### Serious Moving Violations

The following moving violations will result in *immediate termination*:

- Conviction of DWI or DUI
- Conviction of Hit and Run
- Conviction of Careless or Reckless Driving (as defined by CDL)
- Possession of an open alcoholic container
- Conviction of homicide, manslaughter, or assault arising out of operating a motor vehicle
- Attempting to elude an officer
- A preventable accident which was due to driver negligence.

### Cell Phone Policy

Drivers are not permitted to use a hand held cell phone while in operation of a commercial motor vehicle *unless the device can be used hands free*. If the device is not enabled for hand-free use, calls cannot be answered while driving and must go to voicemail.



Image © Nosyrevy / Bigstock

Drivers are not permitted to read or respond to emails or text messages while operating a commercial motor vehicle.

If a driver is cited by any enforcement agency for cell phone use violations or is observed using a handheld device by supervisory employees, the driver will be subject to disciplinary action up to and including termination.

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### Seat Belt Policy

All drivers as well as any authorized passengers inside a Brecht Trucking LLC vehicle are to wear seatbelts at all times per company policy and federal regulations. If this regulation is violated, penalties are as follows:

*First offense* – verbal warning

*Second offense* – written warning

*Third offense* – written warning

*Fourth offense* – suspension

*Fifth offense* – termination



Image from <https://pixabay.com/en/car-law-road-warning-seat-buckle-44127/>

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### Safe Following Distance Policy

All drivers operating under Brecht's authority are expected to maintain safe following distances at all times. Preventable collisions that result due to unsafe following distance will result in drivers being subject to termination. Any driver cited for following too closely will be terminated with no exceptions.

Company policy requires all drivers to keep at least a 6 seconds following distance at all times under normal driving conditions. Under severe conditions, such as inclement weather or road construction, all drivers must increase this following distance at least 1 second for each 10-mph.



Image from Wikimedia Commons  
[https://upload.wikimedia.org/wikipedia/commons/f/fc/Cars\\_driving\\_on\\_an\\_expressway.jpeg](https://upload.wikimedia.org/wikipedia/commons/f/fc/Cars_driving_on_an_expressway.jpeg)

## Parking

- The trailer hand brake must never be used as a parking brake.
- Make sure you have a safe way out and/or to turn around.
- Be aware of no-truck parking signs.
- Never park in the middle of a roadway.
- Watch for low clearance and any overhangs.
- Never park on a ramp.
- If possible, always pull off an exit to stop rather than on the side of a highway.



Photo from ImagineFreedom  
<https://www.flickr.com/photos/95983051@N00/1117403630/>

## Emergency Supplies

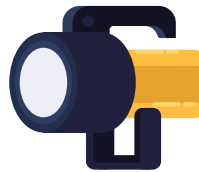
These items are vital for safety and should be present in every truck at all times.



fire extinguisher



reflective triangles



flares



accident kit

Image © Qualit Design / Bigstock

*page 3*

## QUIZ: Safety on the Job

Answer the questions below in as much detail as you can.

1 According to the seat belt policy, how many offenses will lead to a suspension? \_\_\_\_\_

2 Name two serious moving violations that will result in immediate termination:

1. \_\_\_\_\_

2. \_\_\_\_\_

3 It is permissible to quickly type a text message on your cell phone if you are stuck in a traffic jam.

**TRUE** or **FALSE**

4 Name two items that every truck should have as part of its Emergency Supplies:

1. \_\_\_\_\_

2. \_\_\_\_\_

5 What is the maximum speed limit for vehicles at Brecht Trucking? \_\_\_\_\_

6 If there is inclement weather (rain, snow or wind that can create dangerous driving conditions), how many seconds apart should two trucks be if they are driving 60 mph? \_\_\_\_\_  
*Show your calculations.*

7 What is the only circumstance under which cell phones can be used while operating a truck?

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8 When parking your truck, what is one thing to keep in mind?

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## QUIZ: Safety on the Job (ANSWERS)

Answer the questions below in as much detail as you can.

- 1** According to the seat belt policy, how many offenses will lead to a suspension?

Four offenses.

- 2** Name two serious moving violations that will result in immediate termination:

Any two of the following:

- Conviction of DWI or DUI;
- Conviction of Hit and Run;
- Conviction of Careless or Reckless Driving;
- Conviction of homicide, manslaughter, or assault arising out of operating a motor vehicle;
- Possession of an open alcoholic container;
- Attempting to elude an officer;
- A preventable accident which was due to driver negligence.

- 3** It is permissible to quickly type a text message on your cell phone if you are stuck in a traffic jam.

False

- 4** Name two items that every truck should have as part of its Emergency Supplies:

Any two of the following:

- fire extinguisher
- reflective triangles
- flares
- accident kit

- 5** What is the maximum speed limit for vehicles at Brecht Trucking?

68 mph (miles per hour)

- 6** If there is inclement weather (rain, snow or wind that can create dangerous driving conditions), how many seconds apart should two trucks be if they are driving 60 mph?

Company policy requires all drivers to keep at least a 6 seconds following distance under normal driving conditions. Under severe conditions, drivers must increase this following distance at least 1 second for each 10 mph.

60 mph divided by 10 mph = 6 seconds of distance (under severe conditions)

6 seconds of distance (under severe conditions) + 6 seconds of distance  
(under regular conditions) =

12 seconds of distance (between two trucks driving 60 mph)

**7 What is the only circumstance under which cell phones can be used while operating a truck?**

Cell phones can only be used if the device is enabled for hand-free use.

**8 When parking your truck, what is one thing to keep in mind?**

Any one of the following:

- The trailer hand brake must never be used as a parking brake.
- Be aware of no-truck parking signs.
- Watch for low clearance and any overhangs.
- Make sure you have a safe way out and/or to turn around.
- Never park in the middle of a roadway.
- Never park on a ramp.

# Problem-Solving in Transportation and Warehousing: Packing a Shipping Container



Students work in groups to solve a real-world math problem of determining how to arrange boxes on a pallet to fit the maximum number of boxes.

**NOTE:** *One of the standards assessed by the TASC exam requires students to solve real-world mathematical problems involving volume of three-dimensional objects composed of right prisms. This problem allows students to apply geometric methods to a real-world situation. Students at multiple levels can contribute and develop mathematical understanding. It is helpful but not essential for students to have been previously introduced to the concepts of length, area and volume. In the course of the lesson, they will understand that volume is a measurement of the space inside an object, in this case a cardboard box and the 3-dimensional space on a pallet.*



- Estimation
- Geometry
- Volume
- Using math to support a claim

## PREP

- Review the handouts and solve the pallet problem.
- Consider strategies your students might use.
- Optional: Cut out *Nets 1, 2 and 3*.

## MATERIALS

- Optional and recommended: calculators
- Optional and recommended: rulers or tape measures
- Optional: a few empty cardboard boxes
- Optional: 1 cm cubes, available from *ETA Hand2Mind*
- Handouts:
  - *Length, Area, and Volume*
  - *Finding the Area of Nets*
  - *Two Stacks*
  - *Which Stack is Bigger?*
  - *Packing Boxes on a Pallet*
  - *Converting Feet and Inches*
  - *Shipping Pallets of Boxes*
  - *Grid paper*
  - *Scissors and Tape*



## PART 1: Introduction to Volume and Surface Area

### EXPLAIN

- 1** **Ask:** In what situations have you used measurements in inches, in feet, in square inches, in square feet, in cubic inches and cubic feet?

Discuss with a partner and write down your answers.

➤ *Examples of possible responses include:*

**Inches:** *my height, length of my foot, length and width of a piece of paper, inseam of pants, length of screws or nails.*

**Feet:** *my height, length and width of a room, length of a swimming pool, distance around a running track.*

**Square inches:** *amount of paper needed to wrap a gift, small tiles needed for home construction projects.*

**Square feet:** *paint coverage, yard space, tiles on a kitchen floor, size of an apartment or house.*

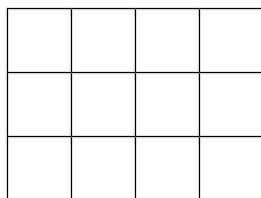
**Cubic inches:** *size of a car motor.*

**Cubic yards:** *buying mulch or gravel, how much an 18-wheeler holds, space in a closet.*

- 2** Distribute and discuss the *Length, Area and Volume* handout.

NOTE: In order to understand *surface area*, your students will need to understand *area*. When we measure area, we are determining the number of squares of a certain size that cover a flat, 2-dimensional space. In reality, there is no difference between the two concepts. Surface area is just the idea of area applied to the surface of a 3-dimensional shape. You may want to review this sequence with students:

- 3** Draw or display this array on the board.



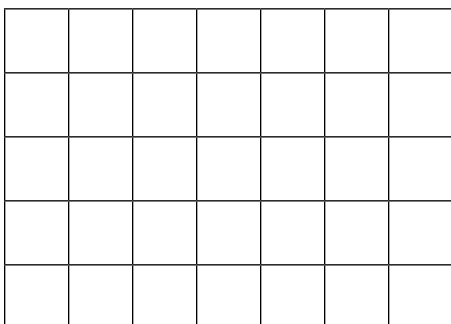
**Say:** We are going to look at two concepts today: **Area** and **Volume**. Area is a measurement of how many squares cover a flat space. When you look at this grid, how many squares do you see? In other words, what is its area?

➤ 12.

How do you know?

- › There are 3 rows of 4 squares.
- › There are 4 columns of 3 squares.
- › 3 times 4 is 12.
- › I counted them.

**3** Draw this array.



What is the area of this rectangle?

- › 35.

How do you know?

- ›  $5 \times 7$ ,  $7 \times 5$ , 5 rows of 7

Would I get the same number if I counted all the squares?

- › Yes.

That would absolutely tell me the area of this figure. It might take a while, but it's a perfectly legitimate way to find the area of a rectangle. It's important that you remember that finding the area is about counting squares. However, you might have faster, more efficient ways of finding the number of squares that don't require you to count every square.

- 4** Distribute *Finding the Area of Nets*. If you cut them out in advance, it will make folding faster later on, but students can also cut out the nets later. Ask students to find the area of the three figures.

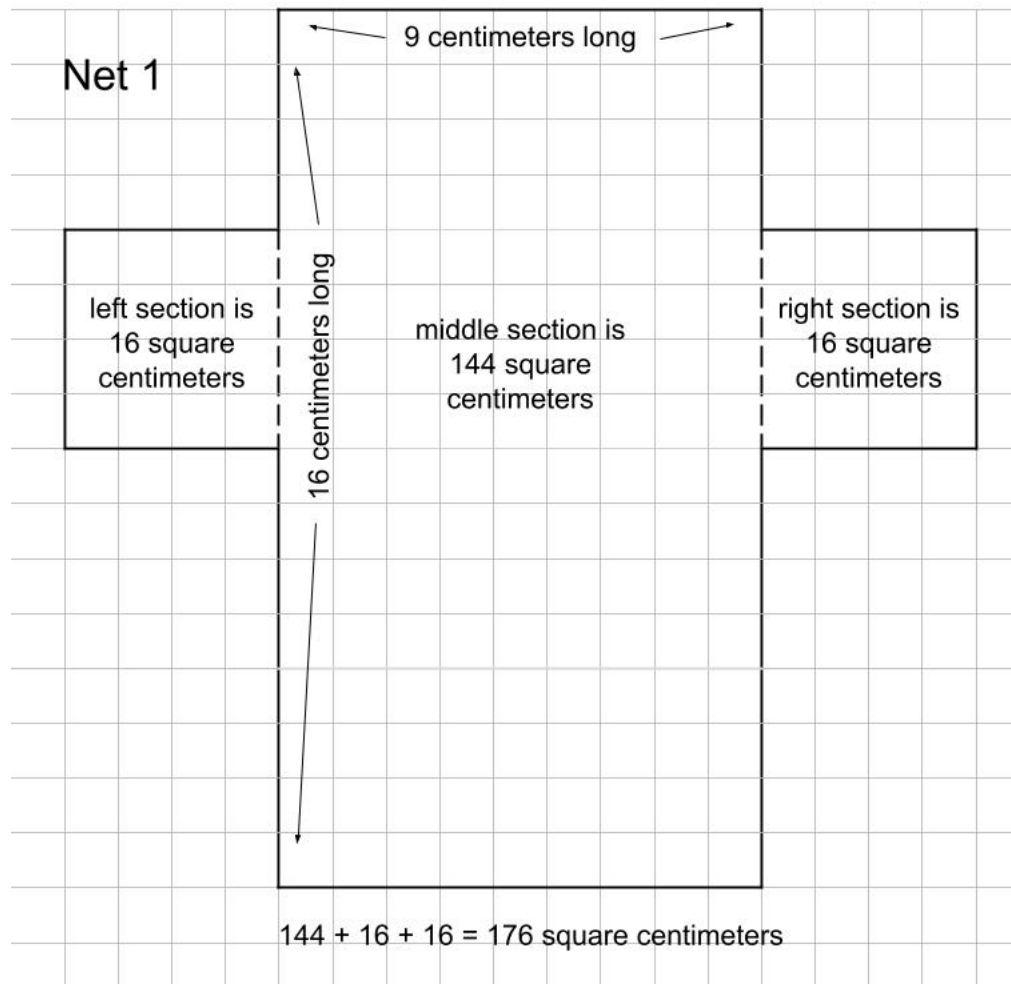
- 5** **Say:** Share how you found the area of the different figures.

There are many different ways of arriving at the same answer. If possible, look for students who found the area in a few different ways, so that students can see that there isn't just one way to solve a problem.

#### NOTE

These figures are called nets. A net is a 2-dimensional pattern for making a 3-dimensional shape. Students will use these nets later to make boxes (rectangular prisms).

Example of one way of seeing the area of Net 1:



**Net 1:** Area of 176 square centimeters

**Net 2:** Area of 174 square centimeters

**Net 3:** Area of 166 square centimeters

For more information on the instructional routine Notice/Wonder, visit <http://bit.ly/CollectEdNYNotWon>

- 6 Look at a handout or projected image of the first page of the *Two Stacks* handout. Write down at least two things you notice about the two stacks, then write at least two questions.
- 7 Share your noticings and wonderings with a partner. Write down things your partner noticed and wondered, then come up with other possible questions as a pair. In a large group discussion afterwards, take notes so that students can see what everyone noticed and wondered.

Students may notice:

- *Each stack is made of cubes of the same size.*
- *The cubes are different colors.*
- *The stacks have different measurements.*
- *Both stacks have 5 layers.*
- *Stack A is wider.*
- *Stack B is longer.*

Make sure that students see:

- **Stack A is 4 cubes wide, 7 cubes long and 5 cubes high.**
- **Stack B is 3 cubes wide, 9 cubes long and 5 cubes high.**

Questions to prompt responses could include:

- **How many cubes are there in each stack?**
- **Which stack has more cubes?**
- **Is there a way to find out how many cubes there are without counting each one?**
- **How big is each cube?**
- **Why did someone make these stacks?**

**8** As mathematicians we refer to these stacks of cubes as **rectangular prisms**, because they are solid (3-dimensional) objects with six faces that are rectangles. Rectangular prisms are also sometimes called cuboids (cube-like). Cubes are a special kind of rectangular prisms where each dimension is the same length. All cubes are rectangular prisms, but not all rectangular prisms are cubes. This is because squares are rectangles, so each face of a cube is a rectangle. **Are you surprised to hear that a square is a rectangle? This is because the basic definition of a rectangle is that opposite sides are equal and there are four 90-degree angles?** Check to see if a square meets these conditions. Not all rectangles are squares, but all squares are rectangles.

**9** In mathematics, a **net** is a pattern that you can cut and fold to make a model of a solid shape. One common example of a net is an unfolded cardboard box. If you have worked in a pizza shop, you may have had to fold pizza boxes. When pizza boxes are delivered to the shop, before they are folded, they would be considered nets. **Can you think of other examples of nets?**

**Why do you think these diagrams are called nets?**

- › *Maybe it's because they wrap around solid 3-dimensional figures like a net.*

**10** Distribute scissors and tape.

- 11 Cut out the nets and fold them into rectangular prisms, attaching the edges with tape.
- 12 Complete the second page of the *Two Stacks* handout.
- 13 After discussing student solutions, you should make the following points:
  - We measure area by counting how many squares would fit in a space. Wrapping paper around an object is a measure of surface area. Surface area is the same as other kinds of area, except that it generally refers to area on the outside of an object like a rectangular prism, cylinder or pyramid. A question like, **How much paper would it take to wrap a gift?**, is about surface area. We find the surface area of a 3-dimensional object by thinking about how many squares would cover its surface. Squares are flat, 2-dimensional objects, as opposed to cubes, which are 3-dimensional.
  - In this case we're measuring these rectangular prisms with square centimeters. If we were measuring the surface area of a wall, we might use square feet. **What if we want to measure the surface area of Earth, what measurement do you think we would use?** When measuring surface area, we can use squares of different measurements, such as square meters, square inches, square feet, square miles, etc. If we're talking about area, then we use squares.
  - When we write a measurement of area, we always include the unit to show the size of the squares we're using to measure the space. In this case, our units are *square centimeters*, which we can also write as  $\text{cm}^2$ . The <sup>2</sup> is an exponent that means we are talking about squares, which are measured with *length* and *width*, two measurements that are multiplied by each other.
  - To find the number of squares (surface area) on the outside of a rectangular prism, you can use this formula:

$$SA = 2lw + 2lh + 2hw$$

*SA* stands for surface area, *l* for length, *w* for width, *h* for height. Students may not realize that each letter represents a measurement from the rectangular prism. They might also not realize that, in a formula, a number next to a letter or a letter next to a letter means that the two quantities should be multiplied so that  $2lw$  means  $2 \times l \times w$ .

You can explain the formula for surface area of a rectangular prism by referring to the earlier solution:  $27 + 27 + 45 + 45 + 15 + 15 = 174$ . Do students see any similarities between the formula and this solution? By grouping the areas of opposite sides of the prism, students may see the surface area formula in this calculation:  $2(3 \times 9) + 2(5 \times 9) + 2(3 \times 5) = 174$ .

Ask students:

**Which of these two stacks is bigger?**

The answer depends on what kind of measurement you're using (height, width, length, volume surface area).

- 14** Distribute and discuss the *Which Stack is Bigger?* handout.


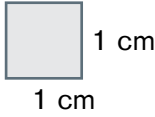
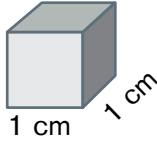
## Length, Area, and Volume

When we measure the size of objects, length, area, and volume are three important measurements that we use to understand the size of things in the world.

**LENGTH** is the distance between two points. This could be a short distance such as an inch or centimeter or a large distance like a mile or kilometer. Your height is a measure of length. We measure distance with rulers, tape measures and odometers (in a car). Height, width, and depth are all measures of length because they are measuring the distance between two points.

**AREA** is the size of a surface. We measure area by counting the number of squares that would cover a surface. These could be square inches, square centimeters, square yards, square miles, etc. The amount of wall space covered by a poster is a measure of area.

**VOLUME** is the amount of space that an object fills. When we measure volume, we imagine filling an object with cubes and then count how many cubes will fit inside the object. You can think about this as the number of cubes that would fill the same amount of space as the object. The amount of water in a swimming pool is a measure of volume.

	Length	Area	Volume
Drawing			
Ways of writing	1 centimeter 1 cm	1 square centimeter 1 cm <sup>2</sup>	1 cubic centimeter 1 cm <sup>3</sup>
Ways of saying	"1 linear centimeter"	"1 square centimeter"	"1 cubic centimeter"
Dimensions	length	length and width	length, width and height

**Look around you. Choose an object to describe.**

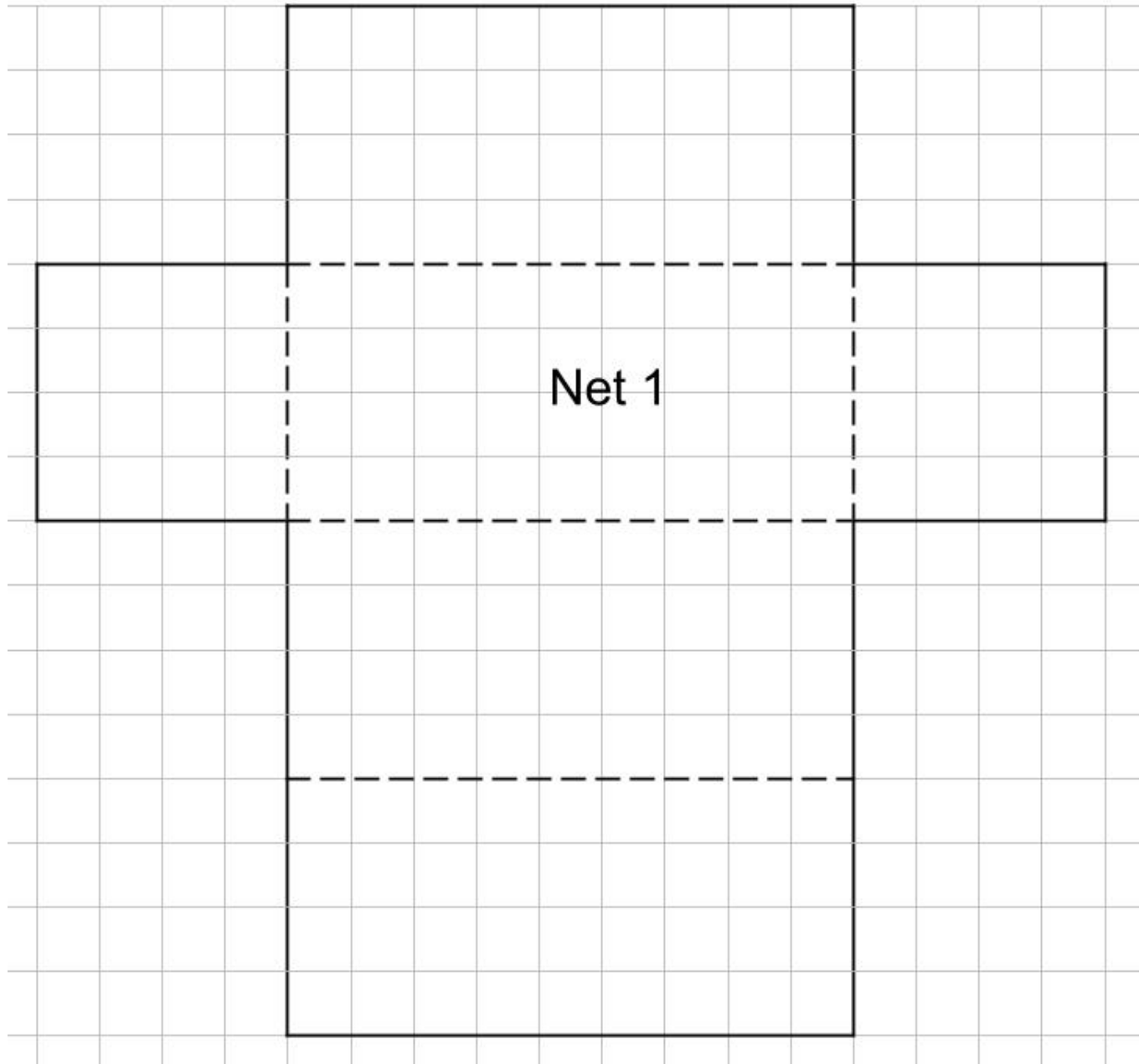
What part of the object is its length?

What part of the object is its area?

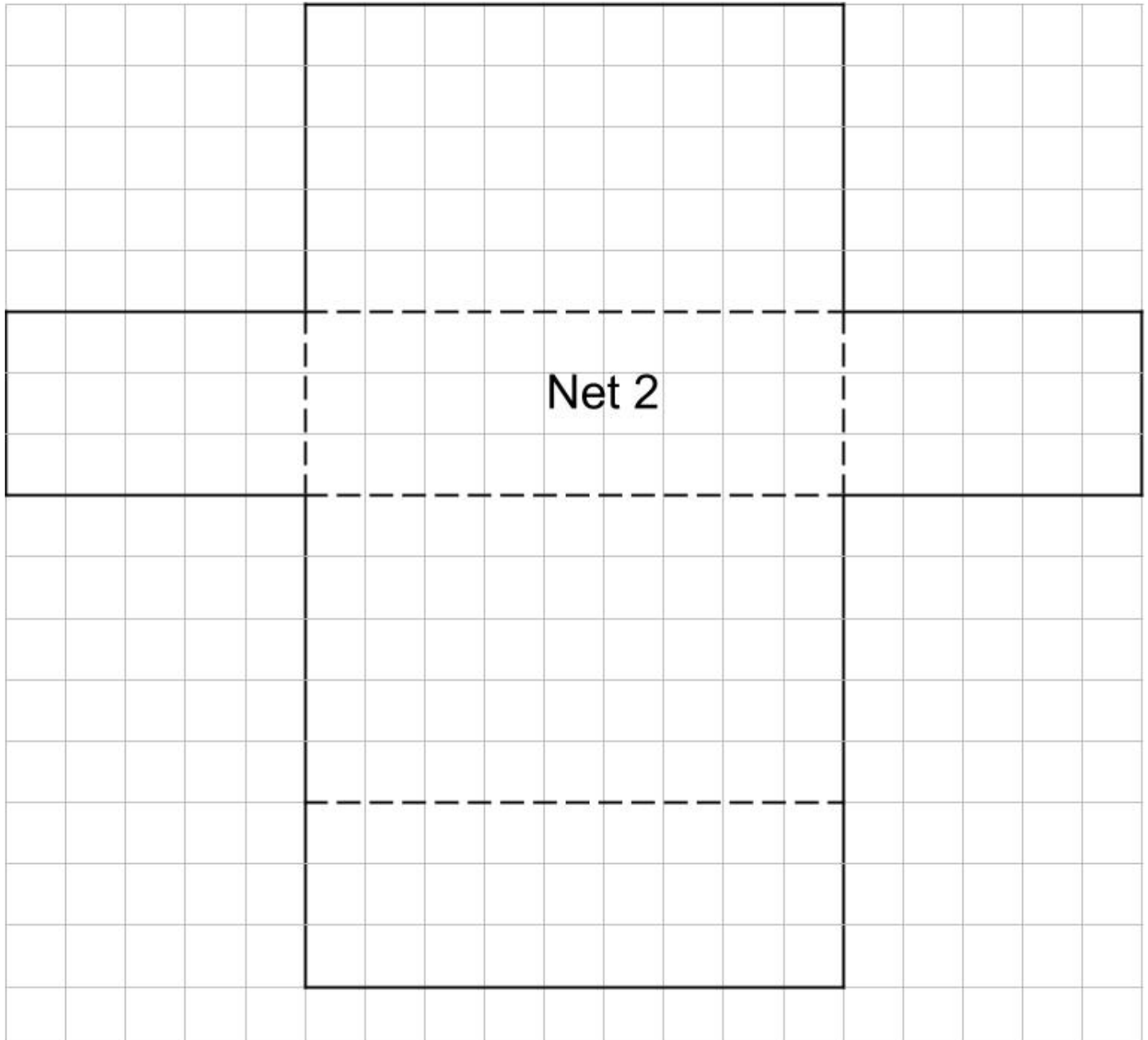
What part of the object is its volume?



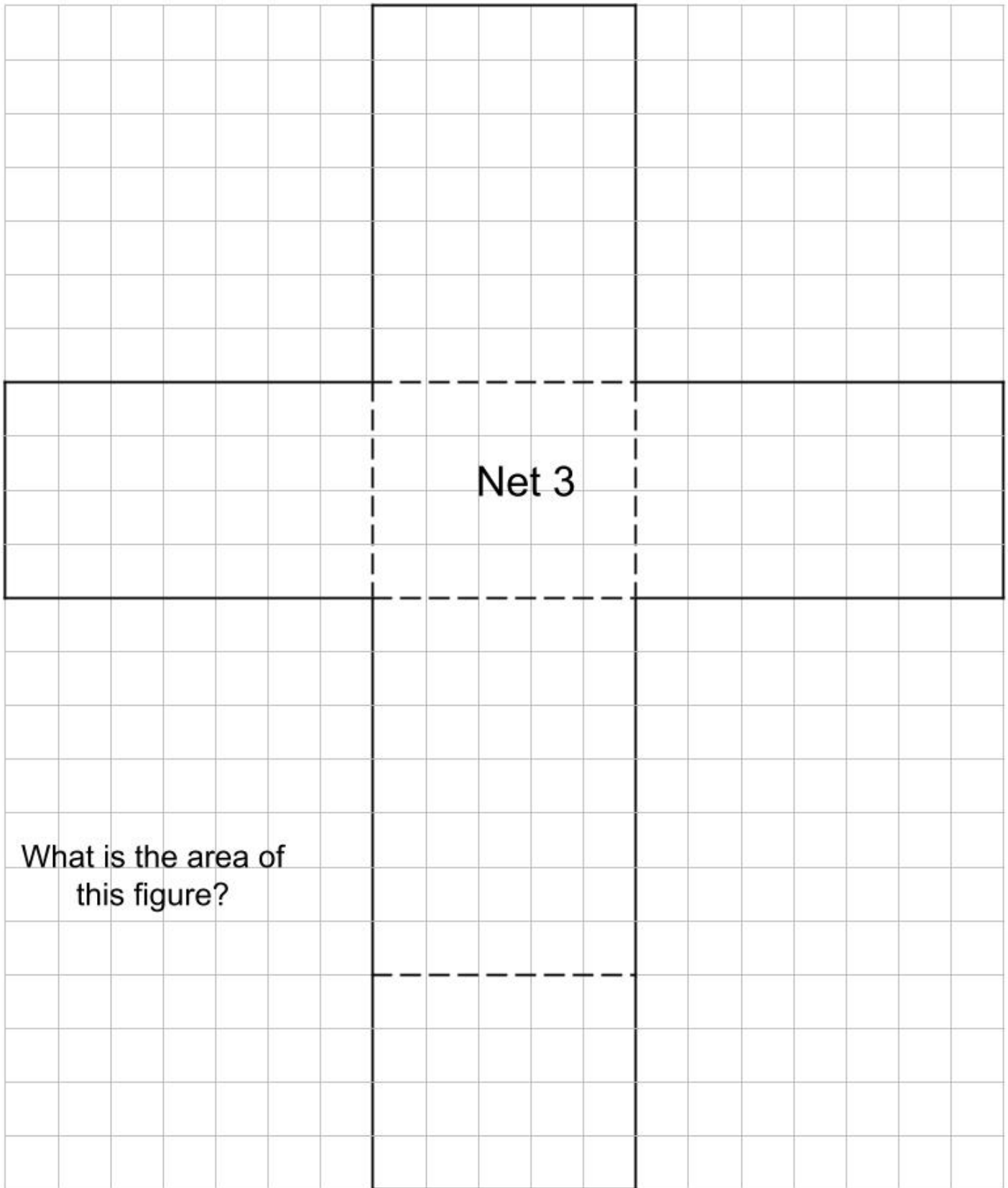
## Finding the Area of Nets



**1 NET 1:** What is the area of this figure? \_\_\_\_\_

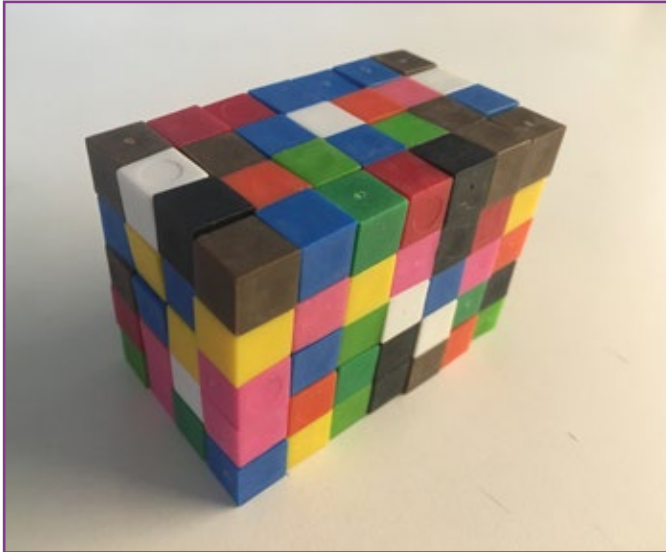


**2** **NET 2:** What is the area of this figure? \_\_\_\_\_

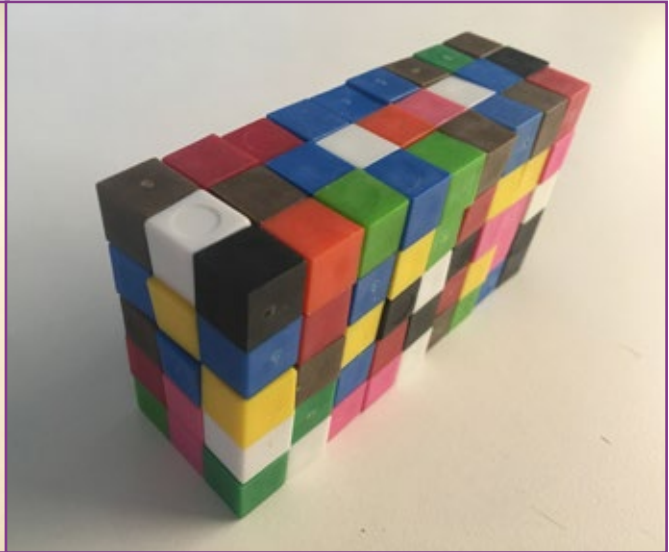


**3** **NET 3:** What is the area of this figure? \_\_\_\_\_

## Two Stacks



**STACK A**



**STACK B**

**1** What do you notice?

**2** What do you wonder?

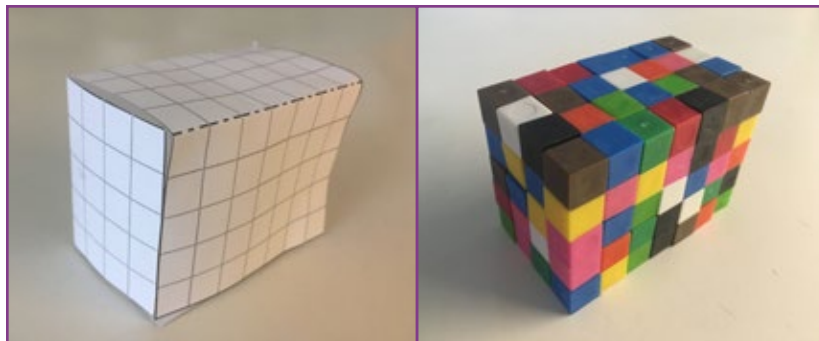
- 3 Which of Nets 1, 2, and 3 is a model for Stack A? How do you know?
- 4 Which of Nets 1, 2, and 3 is a model for Stack B? How do you know?
- 5 If you made Stack A and Stack B with 1 cm cubes, which stack would require more cubes to build? Explain your answer below with words, numbers and/or drawings.
- 6 If you were to cover Stack A and Stack B with paper, which would require more paper? Explain your answer below with words, numbers and/or drawings.

## Teacher Notes and Answer Guide for Two Stacks

The following notes are included for teacher support of Two Stacks.

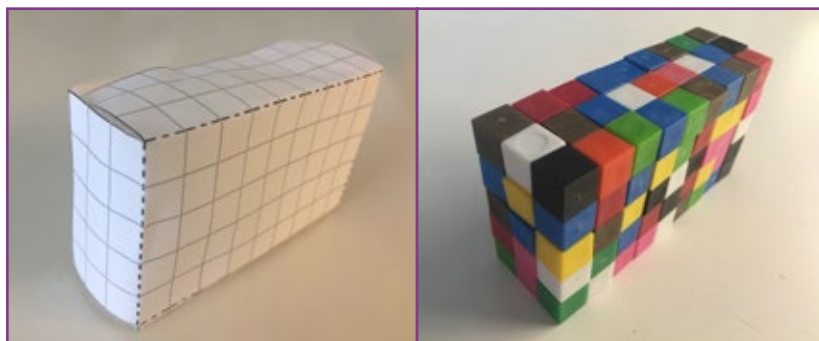
Which of these nets is a model for Stack A? How do you know?

Net 3 because if you measure each of the sides, you will see that each rectangular face has the same dimensions as Stack A: 4cm by 7cm on top, 5cm by 4cm on the front and 5cm by 7cm on the side.



Which of these nets is a model for Stack B? How do you know?

Net 2 because if you measure each of the sides, you will see that each rectangular face has the same dimensions as Stack B: 3cm by 9cm on top, 5cm by 3cm on the front and 5cm by 9cm on the side.



If you made these two stacks with 1cm cubes, which stack would require more cubes to build? Explain your answer below with words, numbers and/or drawings.

## Emphasize conceptual understanding over memorizing formulas

The goal of this activity is not for students to use the formula  $l \times w \times h$ , but for students to understand that volume is less about a formula and more about calculating the number of cubic units in an object. At this stage of the lesson, it is better to avoid using the formula for volume and instead focus on the number of cubes. **Avoid telling students the formula for volume.** There many other ways that students can find the number of cubes which will support their understanding better than using the formula. Later, after they understand that volume is about counting cubes and can explain why this involves multiplication, it will be appropriate for them to use the formula.

Here are some possible solutions:

- Counting the number of cubes in a horizontal layer and adding the layers together. For example, Stack A has 28 cubes in each horizontal layer. There are 5 layers, so  $28 + 28 + 28 + 28 + 28 = 140$  cubes. Students may find the number of cubes in each layer by multiplying  $(4 \times 7)$  and then multiplying by the number of layers (5).
- Counting the number of cubes in each vertical layer and adding the layers together. For example, Stack A has 35 cubes in each vertical layer. There are 4 layers, so  $35 + 35 + 35 + 35 = 140$  cubes. Students may find the number of cubes in each vertical layer by multiplying  $(5 \times 7)$  and then multiplying by the number of layers (4).
- *Length  $\times$  width  $\times$  height.* Some students will remember the formula for volume and will correctly apply it to find the number of cubes in each stack. If a student quickly comes up with 140 cubes for A and 135 cubes for B, ask if they can prove with a drawing why their answer is true. (In discussions with students later, this should be the last strategy to discuss. It is better to talk about alternative strategies students may have come up with, such as the two described above.)

## Discussing process

When students can articulate the methods they used to solve a problem, it helps to solidify their understanding of it, and helps other students find multiple ways of solving the problem. You might do this by having students present how they figured out the answer, writing steps on the board.

After discussing solutions, you should make the following points:

- The number of cubes in each stack is a measure of volume. When we measure volume, we're trying to figure out the size of 3-dimensional space, like a box or a room. We measure volume by counting how many cubes would fit in a space. In this case we're measuring with cubic centimeters.

If we were measuring the amount of air in this room, we might use cubic feet because that would be easier to count than all these little cubic centimeters. If we were talking about the volume of Earth, we might talk about cubic miles, since it's such a huge space. **Can you think of examples of other cubic measurements of volume?** Other measures of volume include cubic meters, cubic inches, cubic yards, etc. The important thing to remember is that if we use the word volume, we mean how many cubes it takes to fill the inside of an object using cubes.

- When we write a measurement of volume, we always include the unit to show the size of the cubes we're using to measure the space. In this case, our units are *cubic centimeters*, which we can also write as  $\text{cm}^3$ . The <sup>3</sup> is an **exponent** that means we are talking about cubes, which are measured with *length*, *width*, and *height*, three measurements that are multiplied by each other.
- If no one used  $\text{length} \times \text{width} \times \text{height}$ , you can give the following explanation: So we saw there are different ways to add up all the cubes. Another way is to calculate the number of cubes in one layer ( $l \times w$ ) and then multiply that by the total number of layers ( $\times h$ ).
- To find the number of cubes (volume) in a rectangular prism, as we saw earlier, you can multiply the length by the width by the height. This method is shown by the formula:

$$V = l \times w \times h$$

$V$  stands for volume,  $l$  for length,  $w$  for width,  $h$  for height.

**If I wanted to wrap all sides of these two stacks with paper, which would require more paper?**

Similar to the volume question, the goal of this activity is not for students to use the formula for the surface area of a rectangular prism to determine how much paper is needed. They should be able to determine this by counting squares on the outside of the figure. It is best to avoid using the words *surface area* until after students already have an answer to which requires more paper. You can then connect the understanding they have developed to the definition of surface area and the formula, after you go over their solutions to the question.

Possible solutions include:

- Counting all the squares within the outline of each net. Net 3 has 174 squares. Net 1 has 166 squares. All the squares are the same size, therefore Net 3 uses more paper.



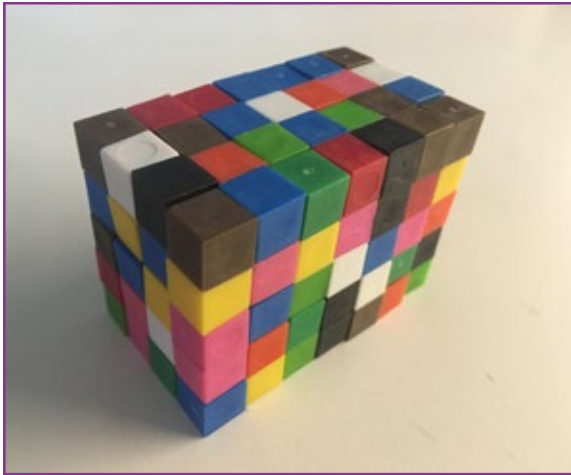
- Finding the area of each rectangular face of the prism using multiplication.

**Stack A:** The top rectangle in has 28 squares because it is 4 cm wide and 7 cm long. The bottom rectangle is also 28 squares. One side of the prism is a 5 by 7 rectangle with 35 squares. The other side also has 35 squares. The rectangular side facing the camera is 4 by 5 with 20 squares. The opposite side is also made up of 20 squares. You can calculate the total number of squares by multiplying the length and width of each rectangle and adding them together:  $28 + 28 + 35 + 35 + 20 + 20 = 166$ .

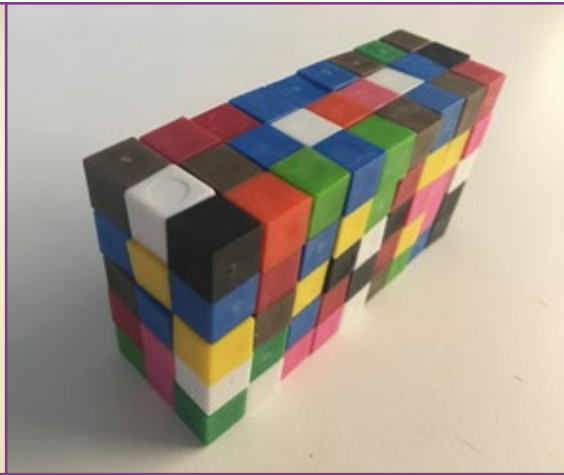
**Stack B:** The top rectangle in has 27 squares because it is 3 cm wide and 9 cm long. The bottom rectangle is also 27 squares. One side of the prism is a 5 by 9 rectangle with 45 squares. The other side also has 45 squares. The rectangular side facing the camera is 3 by 5 with 15 squares. The opposite side is also made up of 15 squares. You can calculate the total number of squares by multiplying the length and width of each rectangle and adding them together:  $27 + 27 + 45 + 45 + 15 + 15 = 174$ .

- Some students may know the formula for the surface area of a rectangular prism. If so, ask if they can prove that their answer is correct using the net of the rectangular prism.

## Which Stack is Bigger?



STACK A



STACK B

**Distance:** One way to measure these stacks is figure out their length, width and height. These are measurements of distance, which we can measure with a ruler. The stacks are made of 1-centimeter (cm) cubes. We measure distance by finding out how far it is from one point to another point.

Stack A is 4 cm wide, 5 cm tall and 7 cm long.

Stack B is 3 cm wide, 5 cm tall and 9 cm long.

**Surface area:** How big is the total surface of the object? In other words, how much paper would be required to cover it completely? Area is measured in squares. Since we're using centimeters to measure the prisms, we would record the area in square centimeters (cm<sup>2</sup>). To find the surface area of a rectangular prism, you can use this formula:

$$SA = (2 \times l \times w) + (2 \times l \times h) + (2 \times h \times w)$$

which can be rewritten as...  $SA = 2lw + 2lh + 2hw$

Stack A has a surface area of 166 cm<sup>2</sup>.

Stack B has a surface area of 174 cm<sup>2</sup>.

Stack B has a bigger surface area. In other words, it would require more paper to be covered.

**Volume:** Another way to measure the size of a rectangular prism is with volume. With this measurement, we're figuring out how many cubes would fill the prism. Since we're using centimeters, we would record the volume in cubic centimeters (cm<sup>3</sup>). To find the volume of a rectangular prism, you can use this formula:

$$V = l \times w \times h$$

Stack A has a volume of 140 cm<sup>3</sup>.

Stack B has a volume of 135 cm<sup>3</sup>.

Stack A has a bigger volume. In other words, there are more cubes in Stack A.

## PART 2: Stacking Boxes on a Pallet

- 1 Distribute *Volume and Surface Area Practice*, and ask students to complete it. This is a review of Part 1, and a preparation for the Packing Boxes on a Pallet problem. It's not necessary that every student have their own net. You might set up groups of 4, so that each student can build one box. Check to make sure that students remember how to calculate volume and surface area, and include the appropriate units when they record their answers.
- 2 Distribute scissors and tape so that students can create boxes from Nets A, B, C, and D.

NOTE: The grid lines represent inches, but the nets are not to scale since the actual measurements wouldn't fit on an 8 1/2" x 11" piece of paper. To help students understand, you might ask students the longest measurement in Box A. One of the dimensions is 16 inches. This is bigger than a piece of paper, which explains why the net was scaled down to fit on a sheet that could be given as a handout.

- 3 Distribute *Packing Boxes on a Pallet*. Ask students to take a few minutes to read the first page a few times and highlight important information. Next, read the page aloud to the group and ask students to talk with a partner to see if they highlighted the same information. Ask for volunteers to share information that they highlighted. This might include:

- Boxes are stacked on the pallet for shipping.
- Companies try to fit as many boxes on the pallet as possible.
- The stack can't be taller than 5 feet high.
- The pallet is 4 feet long and 3 1/3 feet wide.
- The pallet is 6 inches thick.

If it doesn't come up, ask students what 6" means? And what does 4' mean? Make sure students understand that the single hash mark means feet and the double hash mark means inches.

' means feet  
" means inches

Ask students, How many inches are in 4 feet? How long is the pallet in inches? How do you know? Then ask the same questions about 3 1/3 feet. Ask students to write the length and width of the pallet in inches.

- 4 Read the second page of the handout aloud. What new important information is included? Add to the list on the board.
- Boxes come in different sizes.
  - The sizes of each box are given in inches.

Do any of your students recognize that the dimensions of these boxes are the same as the boxes they created?

- 5 Students may have pointed out by now that there is no question on the handout. Ask them to take 2 minutes to write down a mathematical question based on the information they have been given. They should then share their question with a neighbor and then write down any other questions that come to mind.
- 6 Ask students to share their questions and write them on the board so that students can read each other's questions. After all the questions have been shared and written on the board, tell students that they have all raised interesting questions, but the one you'd like help answering is:

**Which box would you use for packing a pallet and how would you pack the pallet?**

Possible process for students to work on the question:

- Ask students to work independently on the problem for 5 minutes, explaining that they will continue their work in a group next. After 5 minutes, ask students to talk to each other about what they have done so far.
- Share a piece of newsprint with each group so they can prepare a poster that expresses their answer and explanation for which are the best boxes for a pallet. Ask them to include words, pictures, anything that will make it clear enough for a team of Packers to follow. Once the posters are done, ask students to put them on the wall for the group to discuss.

When discussing students' answers to *Packing Boxes on a Pallet*, you might ask these follow-up questions either while the group is still working or to the whole class afterwards:

- Which box did this group use?
- What is the volume of this box?
- How many boxes were you able to fit onto the pallet while remaining within the safety recommendations?
- What is the total volume of the boxes you put on the pallet? This is the total volume of goods that you are able to ship with this box and packing arrangement.
- How did you arrange the boxes on the pallet? Can you make a drawing to help us understand your method?
- What is the maximum volume of goods that can be shipped with on a pallet?

- 7 The handout *Converting Feet and Inches* for additional practice as an in-class assignment or homework.
- 8 The handout *Shipping Pallets of Boxes* is included as an optional extension or homework activity.

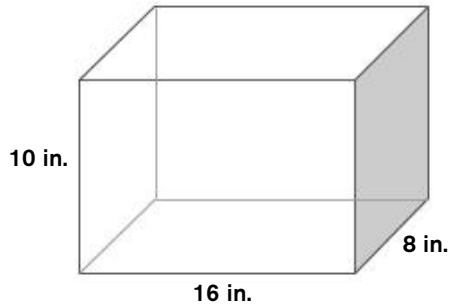
**Solution:** It is possible to arrange the 12" × 16" × 18" box so that 10 boxes fit in 3 layers for a total of 30 boxes, using the maximum space on the pallet. If boxes are packed in this way, 10 pallets would be required to ship 300 boxes.

## Volume and Surface Area Practice

**INSTRUCTIONS:** Using scissors and tape, create boxes using Nets A, B, C, and D. Then calculate the volume and surface area. You might find it helpful to draw and label each box.

### BOX A

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**Volume:** \_\_\_\_\_ cubic inches

**Surface Area:** \_\_\_\_\_ square inches

### BOX B

---

**Volume:** \_\_\_\_\_ in<sup>3</sup>

**Surface Area:** \_\_\_\_\_ in<sup>2</sup>

### BOX C

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**Volume:** \_\_\_\_\_

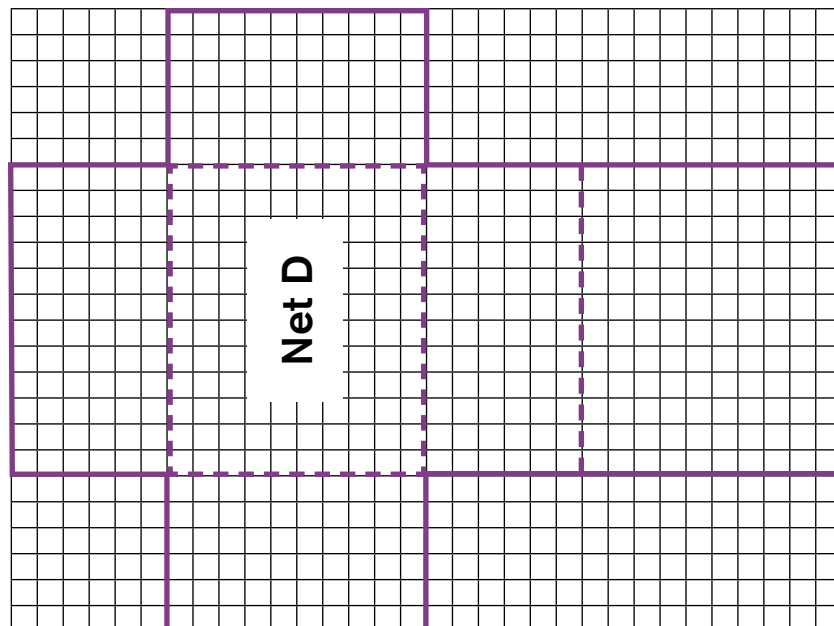
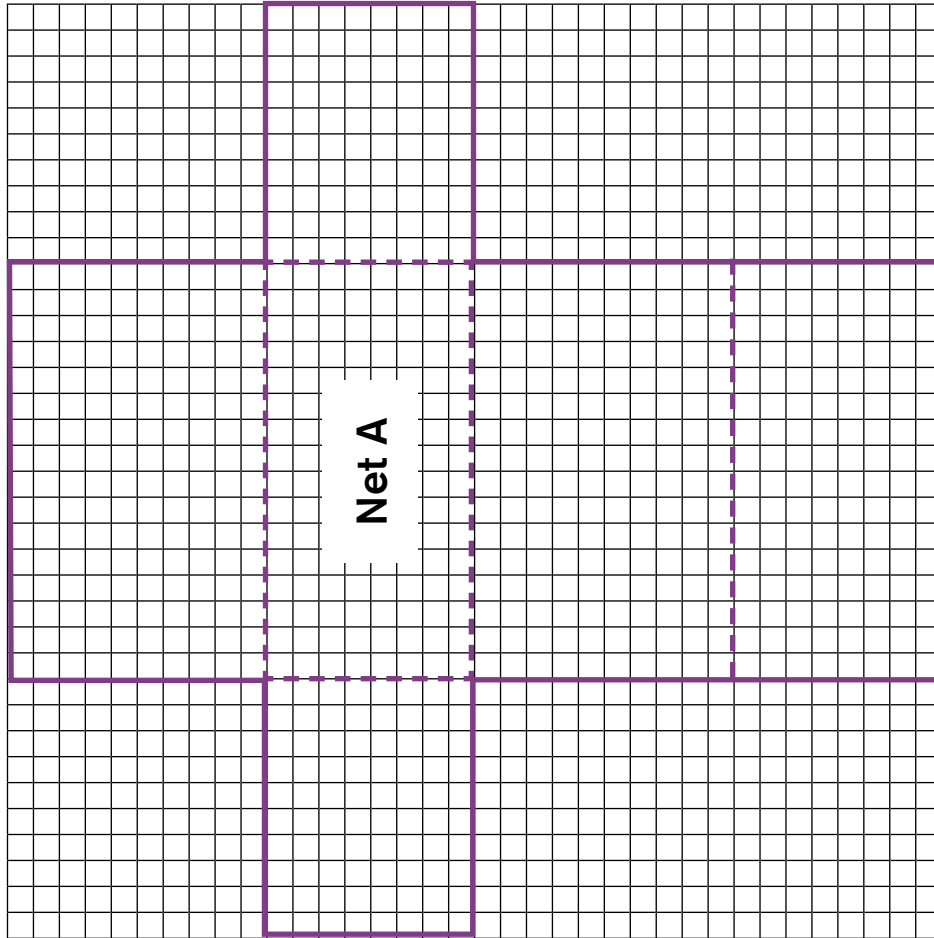
**Surface Area:** \_\_\_\_\_

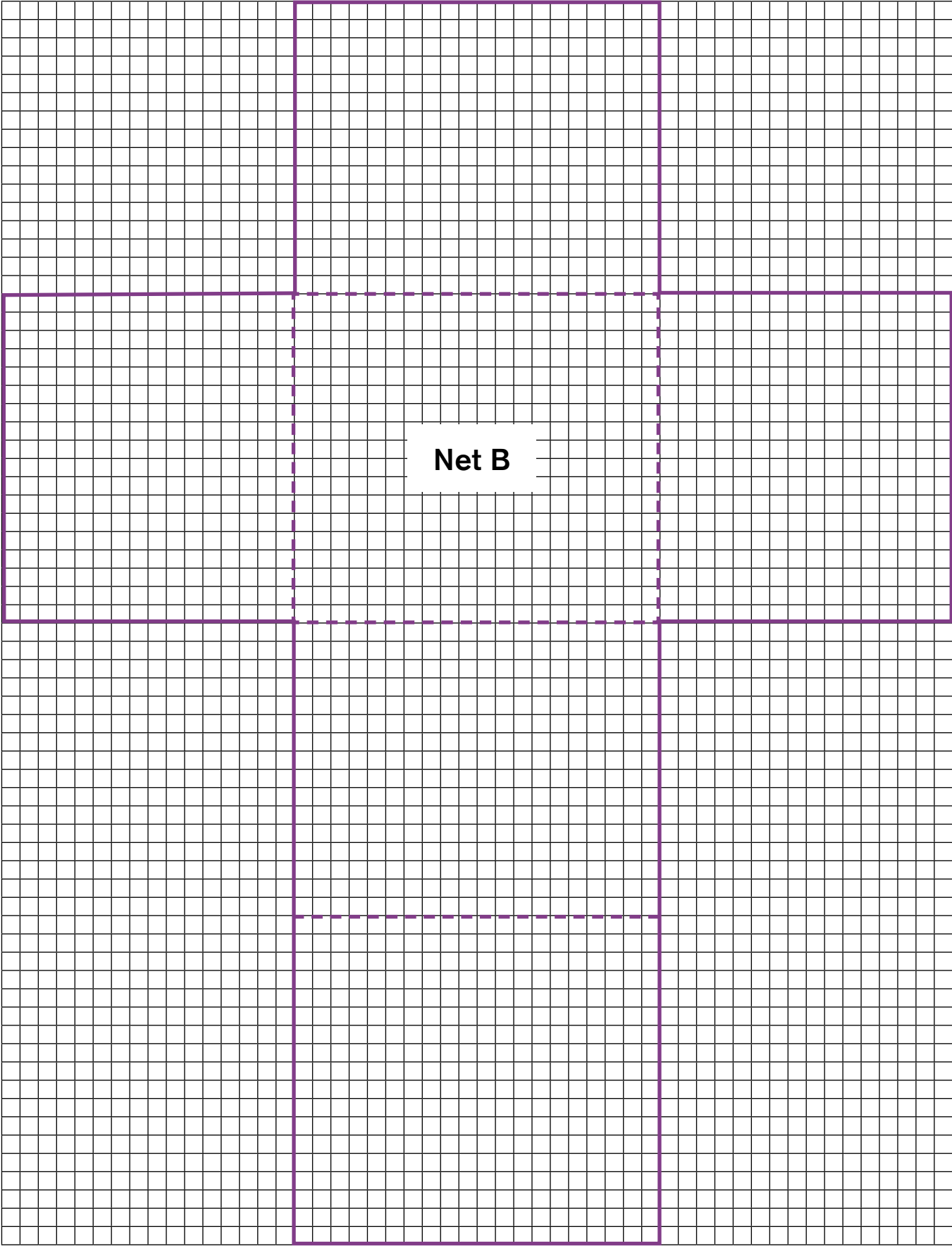
### BOX D

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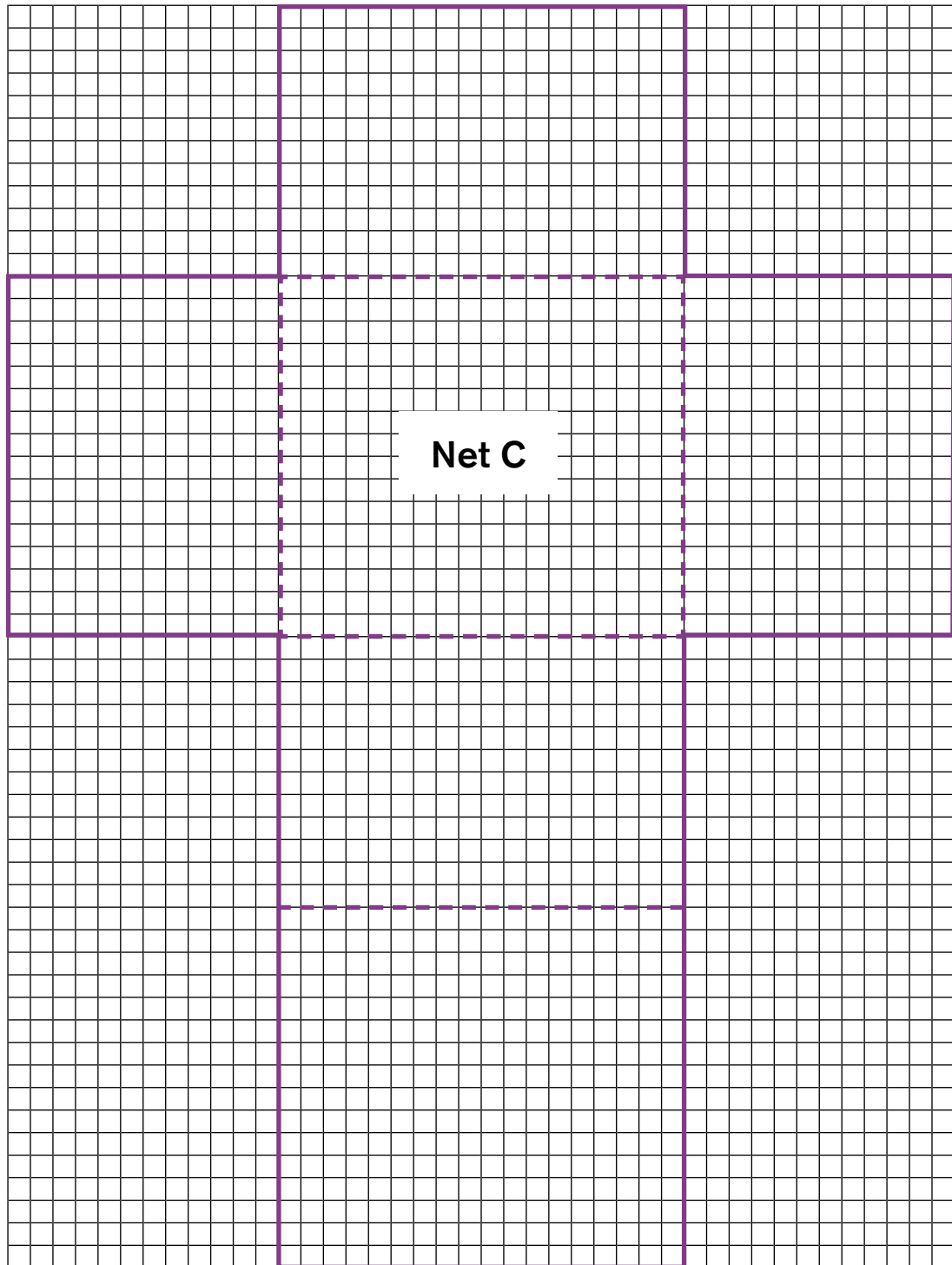
**Volume:** \_\_\_\_\_

**Surface Area:** \_\_\_\_\_









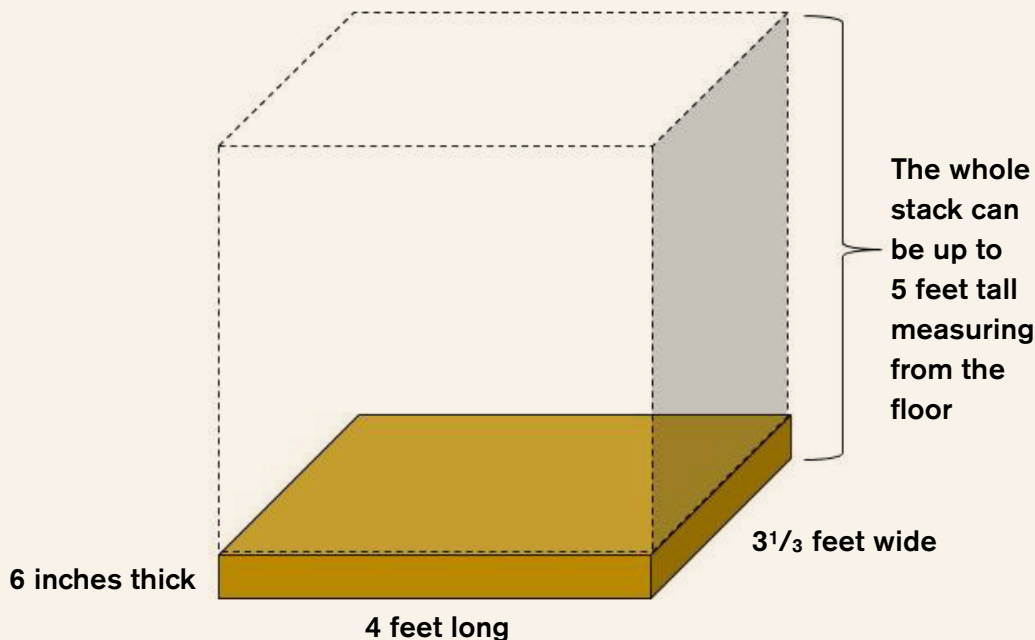
## Packing Boxes on a Pallet

Before transporting products from a factory to a grocery store, companies stack boxes on wooden pallets, secure the boxes with shrink wrap and load them onto trucks for delivery. It's important that the boxes are stacked carefully so that the contents are stable during transportation. Companies try to fit as much on each pallet as they can so they can minimize the cost of transportation. When the pallets arrive at the store, the boxes are unloaded and signed for by a worker who takes inventory. The contents are put on shelves for sale or stored for future shelving.



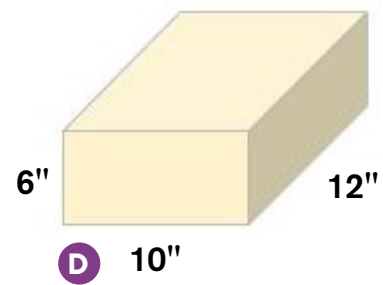
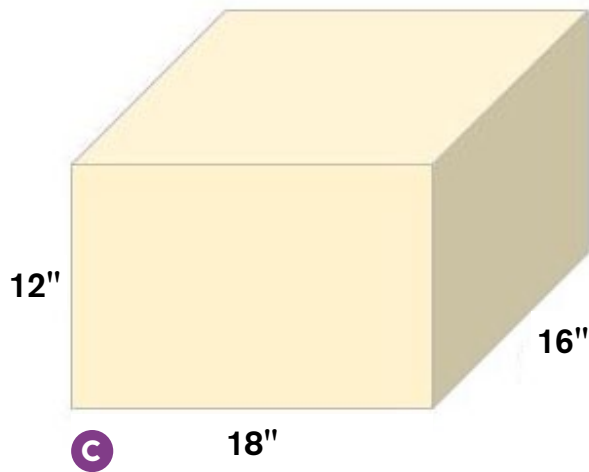
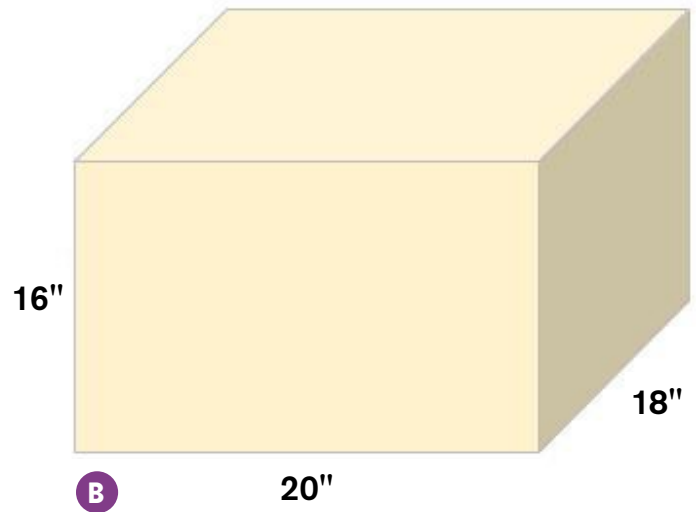
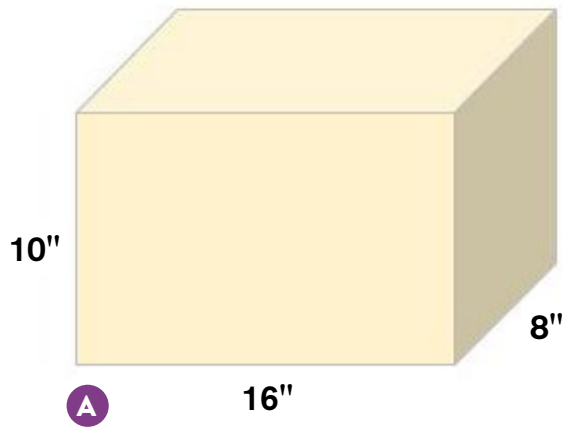
### INFORMATION FOR STACKING BOXES:

- It is recommended that pallets never be stacked higher than 5 feet high, to reduce the danger of boxes falling and injuring someone.
- Standard wooden pallets measure 4 feet by  $3\frac{1}{3}$  feet and are 6 inches thick.
- Boxes should never overhang the edge of the pallet, since this can cause damage to the contents.



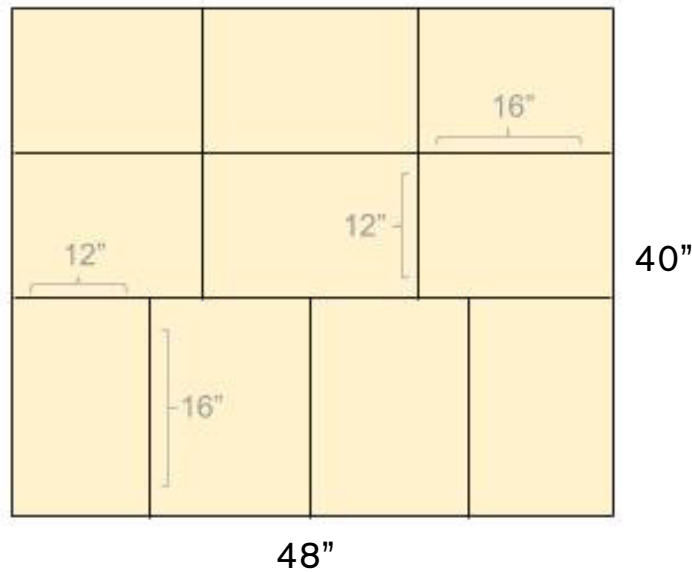


Cardboard boxes come in a variety of sizes.

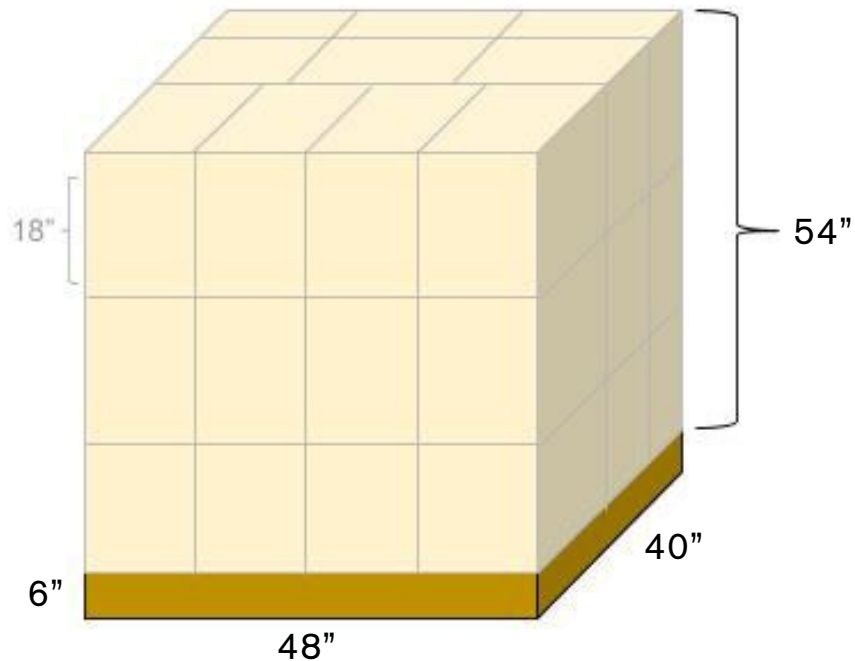


## A Solution to Shipping Pallets of Boxes

View of pallet from above



View of pallet from the side



## Converting Feet and Inches

Fill in the blanks.

Feet	Inches
1 ft	12 in
2 ft	
4 ft	
	96 in.
$\frac{1}{2}$ ft	
	3
$\frac{3}{4}$ ft	
$1\frac{1}{2}$ ft	
	30"
$1\frac{1}{3}$ ft	
	18
5' 2"	

Try some of your own:


Bonus:

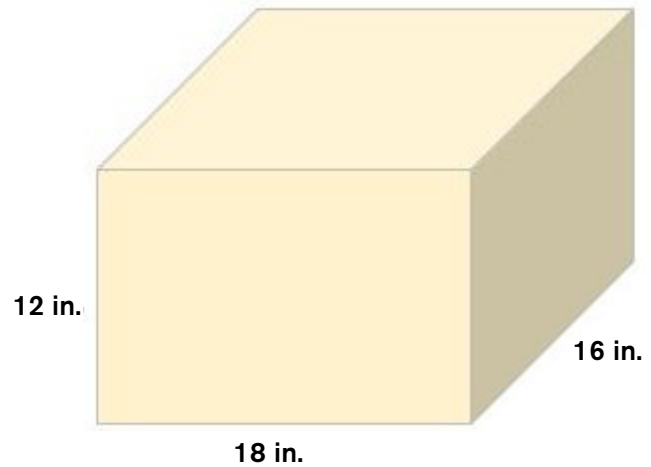
1 ft <sup>2</sup>	_____ square inches
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## Shipping Pallets of Boxes

James has 300 boxes of apples that need to be shipped to New York City. He is using boxes that are 12 inches high, 18 inches long, 16 inches wide.

James will load the boxes onto standard pallets (40 by 48").

**How many pallets will James need in order to pack 300 boxes for shipment?**  
*Please explain with words, numbers and/or drawings.*

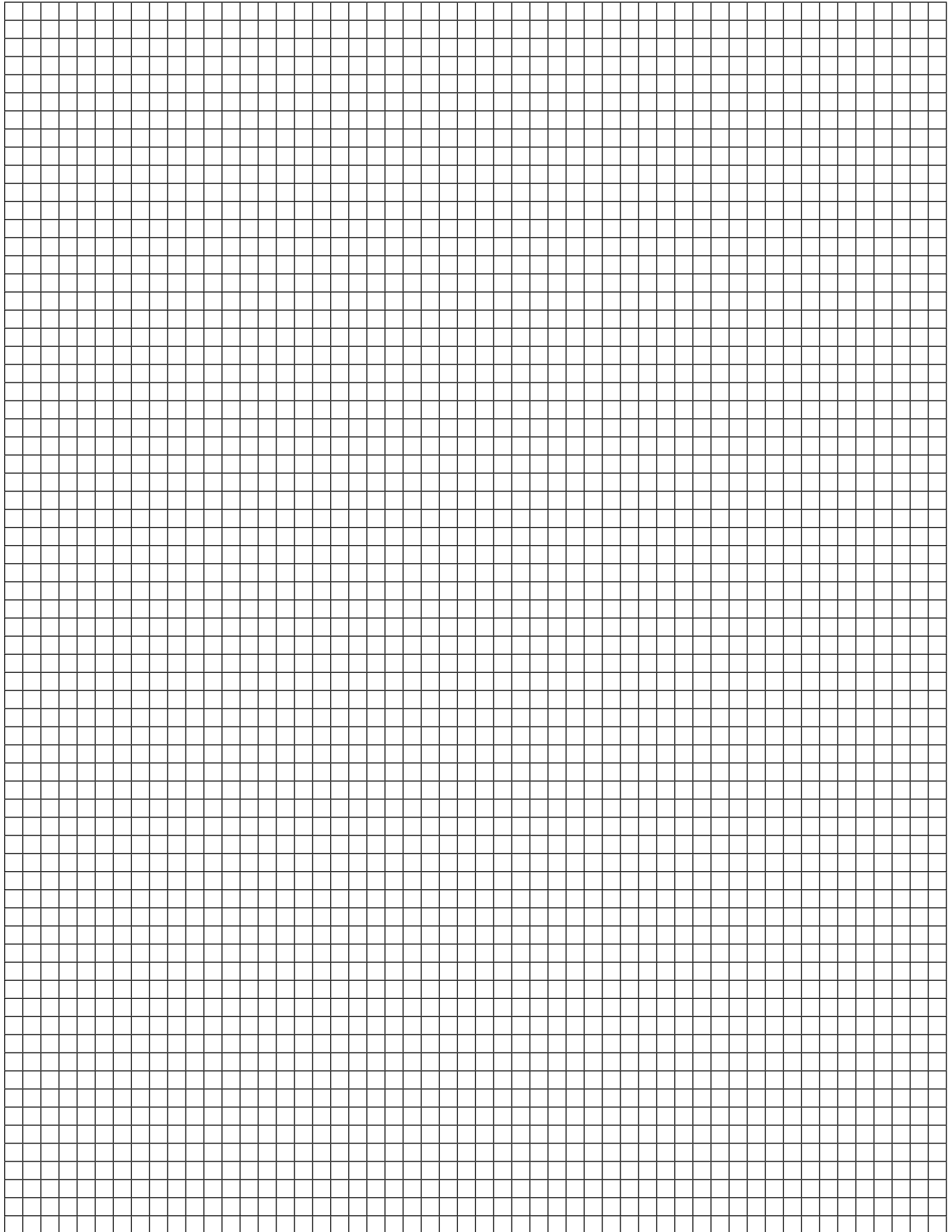


### INFORMATION FOR STACKING BOXES:

- It is recommended that pallets never be stacked higher than 5 feet high, to reduce the danger of boxes falling and injuring someone.
- Boxes should never overhang the edge of the pallet, since this can cause damage to the contents.



## Grid paper



## CUNY Can Get You There Series: CUNY Programs in Transportation and Warehousing\*

Now that students have been exposed to many careers and are developing preferences, they will begin to wonder, how can I work in this field? CUNY offers certificate and degree programs in Transportation and Warehousing. Students do not need to choose one immediately, but should become comfortable learning how to research them.

### ACTIVITIES IN THIS SERIES

**5.1 • Researching CUNY Degree and Certificate Programs in Transportation and Warehousing**

**5.2 • Understanding CUNY Degree Program Requirements**

**5.3 • CUNY Certificate Programs: Automotive Technician at Bronx Community College**

**5.4 • How Do I Enroll in CUNY?\***

### SECTOR TIP

Transportation and Warehousing generally does not require a degree to enter the field, though for certain jobs a degree may be helpful or necessary for advancement. Many Transportation and Warehousing workers are trained on-site or gain their skills in a credentialed training program. As this sector often involves heavy machinery and vehicles, it is important to earn the licenses as required to comply with local and federal safety laws.



\*RAENs will provide regional adaptations.



## Background on CUNY\*

The City University of New York has campuses in all five New York City boroughs. It is comprised of 24 colleges in total, offering Associate's, Bachelor's, Master's, Doctoral and Professional degrees, in addition to Certificate programs. Degree programs are offered through the college's academic departments. Certificate programs are generally offered through the Continuing Education departments.

### CUNY COMMUNITY COLLEGES

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CUNY's community colleges, also known as 2-year colleges, include the Borough of Manhattan Community College, Bronx Community College, Guttman Community College, Hostos Community College, Kingsborough Community College, LaGuardia Community College and Queensborough Community College. These colleges offer Associate's degrees and Certificates. Many adult education students enter degree programs through CUNY's community colleges.

### CUNY SENIOR COLLEGES

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CUNY's senior colleges include Baruch College, Brooklyn College, Queens College, York College, The City College of New York, Lehman College, Hunter College and John Jay College of Criminal Justice. All of these offer Bachelor's degrees. Medgar Evers College, New York City College of Technology and the College of Staten Island offer Bachelor's and Associate's degrees.



\*RAENs will provide regional adaptations.

## Understanding Degrees vs. Certificates

Most CUNY colleges\* offer both certificate and degree programs. Following are some of the main distinctions.

### WHAT ARE DEGREES AND CERTIFICATES?

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College degrees require several years of study and include coursework in a student's major as well as foundational coursework in subjects like English, Math and Science. Degree programs require that students have high school or equivalent diplomas, be accepted for admission to the college, and pass placement exams before enrolling in courses for credit. Most Associate's degrees require 60-65 credits.

Certificate programs vary in their requirements and details. Some are credit-bearing, while others are not. Most require a high school or equivalent diploma, but some do not. Some certificate credits earned may transfer into a degree program if students decide to pursue a degree at a later date. Some lead to licensure, which may have requirements of its own, such as legal residency.

### HOW CAN I PAY FOR DEGREES AND CERTIFICATES?\*

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The tuition for degree programs is a flat rate for full-time students, those who take 12 or more credits per semester. Part-time students, those who take fewer than 12 credits per semester, are charged a rate per credit hour. Students who receive Financial Aid from the federal and/or state governments can use these grants toward tuition. Other sources of financial support for degree programs include loans and scholarships. CUNY also offers a payment plan allowing students to pay tuition in installments.

The college's Financial Aid cannot be used for non-degree programs. Financial support for Certificate programs include other government grants, loans and scholarships. Public Assistance grants can be used toward many Certificate programs.

Some students who are not eligible for federal or state Financial Aid may be eligible for scholarships specifically intended for them, such as in the case of undocumented students.

### WHICH IS BETTER, DEGREE OR CERTIFICATE?

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Both are valid and useful forms of education. Students need to assess their own situations and career goals in order to decide which is right for them.

They should consider:

- How much time they can devote to education, on a weekly basis and in total numbers of years.
- What kind of career they are interested in preparing for.
- How much money they can spend on education, including paying out of pocket, using payment plans, or financial aid if eligible. The college websites list tuition charges as well as information on applying for financial aid, scholarships and payment plans.
- If they are willing to take on the sometimes lengthy process of applying for scholarships, including writing personal essays.
- How much weight the credential (degree or certificate) carries in the labor market, in particular, if it is required or beneficial for the career they want to pursue.



45 MINUTES

# Researching CUNY Degree and Certificate Programs in Transportation and Warehousing\*

Students practice using a college website to locate degree and certificate programs in Transportation and Warehousing, then choose one degree program to research in further detail.

## PREP

### NOTE

Read “How to Lead Students Through a Website Navigation” in the *User’s Guide*, found at [www.tinyurl.com/cunycareerkits](http://www.tinyurl.com/cunycareerkits)

- Go to the Bronx Community College (BCC)\* website, [www.bcc.cuny.edu](http://www.bcc.cuny.edu). Under the **Academics** tab at the top of the page, click on **Academic Degree Programs** from the drop-down menu. Read the descriptions of the majors that lead to Transportation and Warehousing degrees, such as *Engineering Science*, *Automotive Technology*, *Computer Information Systems* and any others you think can lead to jobs in the Transportation and Warehousing sector.
- In the left-hand bar at the bottom of the page under **Future Students**, click on **Workforce and Economic Development**, then on **Workforce and Economic Development Catalog (PDF)**, and read about courses that relate to Transportation and Warehousing, such as Basic Project Management and Professional Driving School Instructor Certification.

NOTE: College websites are frequently updated. If site organization is different from what is described here, take notes that you can use to lead students through a website navigation using the current website organization.

- Be prepared to discuss the terms: **college major**, **college degree**, **certificates** and **credential**. (See previous pages for definitions.)
- Write the URL for Bronx Community College on the board:

[www.bcc.cuny.edu](http://www.bcc.cuny.edu)

## VOCABULARY

college major  
college degree  
certificates  
credential

## MATERIALS

- This session requires use of a computer lab.
- Transportation and Warehousing Majors and Certificates at Bronx Community College* handout
- Exploring a College Degree in Transportation and Warehousing* handout



\*RAENs will provide regional adaptations.

**EXPLAIN**

- 1 Colleges and universities generally offer a number of different programs that culminate in students earning certificates, Associate's degrees and Bachelor's degrees, among others. **What are the big differences between these programs?**

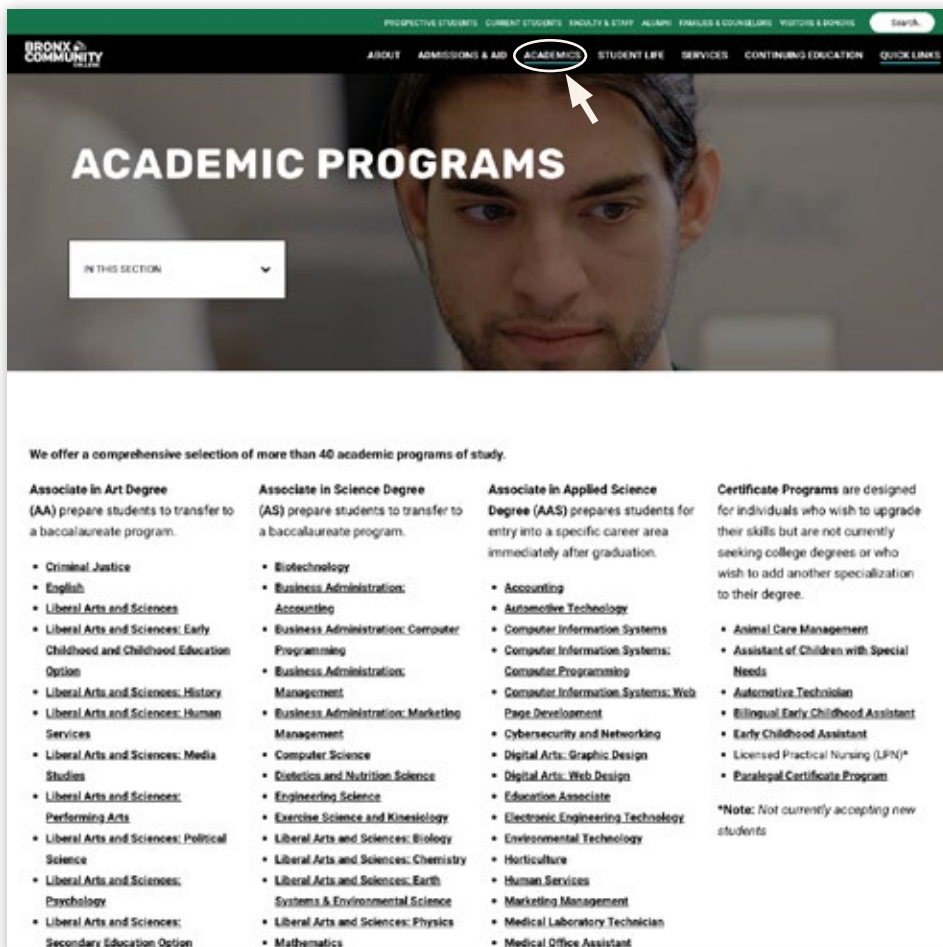
› *Amount of time in program, cost, level of credential, depth of study, courses offered.*

- 2 What is the difference between a college major and a college degree?

› *A major is the subject, program or area of study. A degree is the credential you earn when you complete the program (Bachelor's, Associate's, Master's, etc.).*

- 3 In many, though not all fields a degree is considered a higher level credential than a certificate, but many careers in Transportation and Warehousing do not require more than a certificate, so both are important to consider. Also keep in mind that while you can get a job in Transportation and Warehousing without a degree or certificate, some jobs in the field do require one. Today you're going to explore the Transportation and Warehousing programs that Bronx Community College\* offers.

- 4 Distribute *Transportation and Warehousing Majors and Certificates at Bronx Community College* handout. Ask students to navigate to the college's website (written on the board), then click on **Academics**, then **Academic Degree Programs**, and identify majors that they think belong to the Transportation and Warehousing sector and write them on the handout.

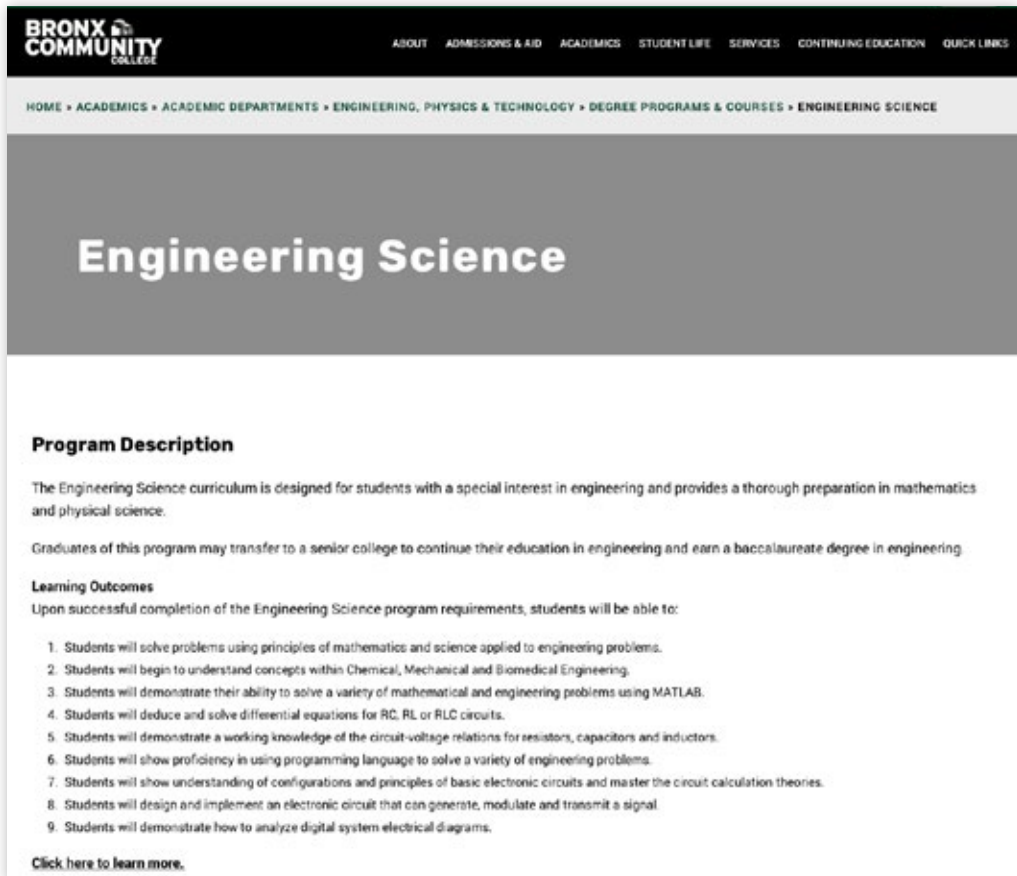
**ACADEMIC PROGRAMS**

We offer a comprehensive selection of more than 40 academic programs of study.

Associate in Art Degree (AA)	Associate in Science Degree (AS)	Associate in Applied Science Degree (AAS)	Certificate Programs
<ul style="list-style-type: none"> <li>Criminal Justice</li> <li>English</li> <li>Liberal Arts and Sciences</li> <li>Liberal Arts and Sciences: Early Childhood and Childhood Education Option</li> <li>Liberal Arts and Sciences: History</li> <li>Liberal Arts and Sciences: Human Services</li> <li>Liberal Arts and Sciences: Media Studies</li> <li>Liberal Arts and Sciences: Performing Arts</li> <li>Liberal Arts and Sciences: Political Science</li> <li>Liberal Arts and Sciences: Psychology</li> <li>Liberal Arts and Sciences: Secondary Education Option</li> </ul>	<ul style="list-style-type: none"> <li>Biotechnology</li> <li>Business Administration: Accounting</li> <li>Business Administration: Computer Programming</li> <li>Business Administration: Management</li> <li>Business Administration: Marketing Management</li> <li>Computer Science</li> <li>Dietetics and Nutrition Science</li> <li>Engineering Science</li> <li>Exercise Science and Kinesiology</li> <li>Liberal Arts and Sciences: Biology</li> <li>Liberal Arts and Sciences: Chemistry</li> <li>Liberal Arts and Sciences: Earth Systems &amp; Environmental Science</li> <li>Liberal Arts and Sciences: Physics</li> <li>Mathematics</li> </ul>	<ul style="list-style-type: none"> <li>Accounting</li> <li>Automotive Technology</li> <li>Computer Information Systems</li> <li>Computer Information Systems: Computer Programming</li> <li>Computer Information Systems: Web Page Development</li> <li>Cybersecurity and Networking</li> <li>Digital Arts: Graphic Design</li> <li>Digital Arts: Web Design</li> <li>Education Associate</li> <li>Electronic Engineering Technology</li> <li>Environmental Technology</li> <li>Horticulture</li> <li>Human Services</li> <li>Marketing Management</li> <li>Medical Laboratory Technician</li> <li>Medical Office Assistant</li> </ul>	<ul style="list-style-type: none"> <li>Animal Care Management</li> <li>Assistant of Children with Special Needs</li> <li>Automotive Technician</li> <li>Bilingual Early Childhood Assistant</li> <li>Early Childhood Assistant</li> <li>Licensed Practical Nursing (LPN)*</li> <li>Paralegal Certificate Program</li> </ul>

\*Note: Not currently accepting new students

- 5 When choosing a program, it's important to find out in-depth information about exactly what you will be studying. We're going to explore one degree program more in-depth: the Associate's of Science (A.S.) in Engineering Science. Ask students to find and click on the link for that degree.
- 6 Distribute *Exploring a College Degree in Transportation and Warehousing* handout. Ask students to complete it based on the information in the description of the A.S. in Engineering Science degree program.



The screenshot shows the website for Bronx Community College. The header includes the college logo and navigation links: ABOUT, ADMISSIONS & AID, ACADEMICS, STUDENT LIFE, SERVICES, CONTINUING EDUCATION, and QUICK LINKS. Below the header is a breadcrumb trail: HOME > ACADEMICS > ACADEMIC DEPARTMENTS > ENGINEERING, PHYSICS & TECHNOLOGY > DEGREE PROGRAMS & COURSES > ENGINEERING SCIENCE. The main heading is "Engineering Science". Under "Program Description", it states: "The Engineering Science curriculum is designed for students with a special interest in engineering and provides a thorough preparation in mathematics and physical science." and "Graduates of this program may transfer to a senior college to continue their education in engineering and earn a baccalaureate degree in engineering." Under "Learning Outcomes", it says: "Upon successful completion of the Engineering Science program requirements, students will be able to:" followed by a numbered list of 9 outcomes. At the bottom, there is a link: "Click here to learn more."

**BRONX COMMUNITY COLLEGE**

ABOUT ADMISSIONS & AID ACADEMICS STUDENT LIFE SERVICES CONTINUING EDUCATION QUICK LINKS

HOME > ACADEMICS > ACADEMIC DEPARTMENTS > ENGINEERING, PHYSICS & TECHNOLOGY > DEGREE PROGRAMS & COURSES > ENGINEERING SCIENCE

## Engineering Science

### Program Description

The Engineering Science curriculum is designed for students with a special interest in engineering and provides a thorough preparation in mathematics and physical science.

Graduates of this program may transfer to a senior college to continue their education in engineering and earn a baccalaureate degree in engineering.

### Learning Outcomes

Upon successful completion of the Engineering Science program requirements, students will be able to:

1. Students will solve problems using principles of mathematics and science applied to engineering problems.
2. Students will begin to understand concepts within Chemical, Mechanical and Biomedical Engineering.
3. Students will demonstrate their ability to solve a variety of mathematical and engineering problems using MATLAB.
4. Students will deduce and solve differential equations for RC, RL or RLC circuits.
5. Students will demonstrate a working knowledge of the circuit-voltage relations for resistors, capacitors and inductors.
6. Students will show proficiency in using programming language to solve a variety of engineering problems.
7. Students will show understanding of configurations and principles of basic electronic circuits and master the circuit calculation theories.
8. Students will design and implement an electronic circuit that can generate, modulate and transmit a signal.
9. Students will demonstrate how to analyze digital system electrical diagrams.

[Click here to learn more.](#)

## Transportation and Warehousing Majors and Certificates at Bronx Community College

Use the college website to find majors and certificates in Transportation and Warehousing offered at the college. For college majors that lead to degrees, look under the Academics section of the website. For certificate programs, look in the Continuing Education Department. List a minimum of 8 in total.

College Website: [www.bcc.cuny.edu](http://www.bcc.cuny.edu)

### MAJORS LEADING TO DEGREES IN TRANSPORTATION AND WAREHOUSING

- 1.
- 2.
- 3.
- 4.

Describe where on the college website you found this information:

### CERTIFICATES IN TRANSPORTATION AND WAREHOUSING

- 1.
- 2.
- 3.
- 4.

Describe where on the college website you found this information:

## Exploring College Degree in Transportation and Warehousing

Use the Bronx Community College website ([www.bcc.cuny.edu](http://www.bcc.cuny.edu)) to read about the Automotive Technology major, then paraphrase the information you find to complete the questions below. Make sure your answers are in your own words.

- 1 What is the name of the major?
- 2 What type of degree is it (Associate's of Science, for example)?
- 3 Name four careers this degree prepares students for.
  - 1.
  - 2.
  - 3.
  - 4.
- 4 How many credits can you earn in this program?
- 5 Which academic department is this major a part of?
- 6 Is there an internship, placement, or practice portion of this program? Explain.
- 7 Write about one part of the program that sounds interesting to you and explain why.  
Write about one part that sounds like it might be challenging for you and explain why.



# Understanding CUNY Degree Program Requirements\*



60 MINUTES

Students read a description of a sample Transportation and Warehousing major and identify the roles of various general education requirements within the overall course of study. Requirements of majors at other colleges may be organized differently from those at CUNY.

## PREP

- Researching college degrees involves learning about which courses are required of which majors. Every major has course requirements. Some requirements specify a particular course; other requirements allow students to choose from several related courses. Most students are required to take two semesters of English composition. Other requirements may include Math, Science, Humanities, Social Sciences, Foreign Languages and/or Arts courses. Sometimes students have difficulty understanding the relevance of general education requirements to their major.
- Requirements for majors are divided into two main areas—**Curriculum (or Major)** Requirements, which are the courses that relate directly to the major; and **General Education** requirements, which are divided into two parts: **Required Core** and **Flexible Core** requirements. Course requirements of the major are usually outlined in the description of the major in the Academics section of the college website. See the description of the Automotive Technology major at Bronx Community College on the next page as an example.
- Read the **Automotive Technology** description in the Bronx Community College website, and practice navigating there from the **Academics** area of the BCC website.

### NOTE

Read “How to Lead Students Through a Website Navigation” in the *User’s Guide*, found at [www.tinyurl.com/cunycareerkits](http://www.tinyurl.com/cunycareerkits)

## MATERIALS

- This session requires use of a computer lab.
- *Understanding General Education Requirements* handout

## EXPLAIN

- 1 Today we’re going to practice navigating a college website to learn how to identify the courses required for a given major. We’re going to use Automotive Technology as a sample major. In the future, you will be able to research any major or certificate that you are interested in, using your skill in navigating college websites.



\*RAENs will provide regional adaptations.

What do you think the Automotive Technology major is all about?

➤ *The major prepares students to maintain, diagnose, service and repair automobiles through their understanding of various automotive systems.*

2 What courses do you think are required for this major?

➤ *Oceanography, piloting, marine operations, vessel technology*

3 Write **BCC.cuny.edu** on the board and have students navigate there, circulating to make sure they are all on the correct page. Then ask them to click on **Academics**, then **Academic Degree Programs**, then find and click on the **A.A.S. in Automotive Technology**.

4 Ask students to read the description of the major and identify some of the tasks they think might be required of people who work in the field of Automotive Technology. Write their responses on the board.

*They might say things like: figure out what's causing a car problem; repair problems that arise, like faulty brakes or a broken air-conditioning unit.*

5 Ask students to look at the rest of the page. Explain that the major requirements come in two parts: **curriculum requirements** and **general education** requirements. General education requirements are further divided into **core** and **flexible core** requirements. Curriculum requirements are the courses that directly relate to the major or career. Core and flexible core requirements are courses that students in this and other majors take across a variety of departments, many of which prepare students for further study in their major area.

6 Divide students into groups of three.

Ask each group to navigate to the **Academics** section of the BCC website, then **Academic Resources**, then click to download the **College Catalog**. They will need to read the course descriptions in the catalog to answer the questions on the handout.

Distribute the *Understanding Degree Program Requirements* handout and ask students to complete it using the course descriptions.

## AUTOMOTIVE TECHNOLOGY

**Associate in Applied Science Degree | Career Program**  
**Department of Engineering, Physics and Technology**

### Program Description

The Automotive Technology curriculum, the only one of its kind in the City University of New York, prepares the student for a career as an automotive technician. This curriculum develops understanding of operational principles, service sequences and diagnostic techniques for the automobile. Upon completion of this curriculum, the graduate is prepared for entry-level positions in various areas of the automotive industry dealing with development, testing, diagnosis and service of mechanical, hydraulic, electrical and thermodynamic automotive systems.

Automotive Technology graduates are employed in a variety of automotive-oriented positions including test technician, diagnostician, equipment sales and service, independent business administrator, dealership service manager, service writer, engine machinist, fuel injection, automatic transmission and engine management specialist, as well as general service technician. Further training and education can lead to careers in technical education, engineering, insurance appraisal, accident investigation and other specialties. The program articulates with SUNY Empire State College. See the Transfer Planning web site for more information.

The Automotive Technology associate degree program is accredited by the ASE Education Foundation (<http://www.aseeducation.org/>).

### Learning Outcomes

Upon successful completion of the Automotive Technology program requirements, students will be able to:

1. Demonstrate proper safety procedures, accident prevention and shop procedures in an active garage.
2. Demonstrate understanding of fundamental internal combustion engines and be able to perform basic mechanical diagnosis and repair.
3. Calculate hydraulic pressures within a drum and disc brake system.
4. Demonstrate proficiency in the use of computer diagnostic equipment, such as proper use of a scan tool and oscilloscope.
5. Calculate gear ratios and demonstrate understanding of torque multiplication in transmissions.
6. Explain how alignment angles can affect a vehicle's handling performance and tire wear.

7. Demonstrate a working knowledge of manifold gauge set readings and how they relate to air conditioning performance.
8. Use wiring schematics and electrical test equipment to diagnose electrical problems.
9. Diagnose automatic transmission issues including torque converter operation.

Upon successful completion of the Automotive Technology Option requirements, students will be able to:

1. Recognize different configurations of hybrid vehicles, and how to interact with them safely.
2. Demonstrate emissions diagnostics by utilizing knowledge of 5 gas analyzation, stoichiometry, and interaction with the OBD2 system.

Upon successful completion of the Diesel Technology Option requirements, students will be able to:

1. Demonstrate understanding of the environmental issues concerning diesel fuel emissions.
2. Demonstrate the understanding of basic fuel delivery of diesel engines.
3. Locate and identify the components of an air brake system.

## AUTOMOTIVE TECHNOLOGY CURRICULUM (PATHWAYS)

60 Credits required for AAS Degree

Curriculum Coordinator: Mr. Clement Drummond

### Required Core

#### A. English Composition

- ENG 110 Fundamentals of Composition and Rhetoric  
OR ENG 111 Composition and Rhetoric I (3 Credits)
- ENG 112 Composition and Rhetoric II (3 Credits)

#### C. Life and Physical Sciences

- CHM 11 General Chemistry I OR  
CHM 17 Fundamentals of General Chemistry I (4 Credits)

### Flexible Core

#### A. World Cultures and Global Issues

- HIS 10 History of the Modern World OR  
HIS 11 Introduction to the Modern World (3 Credits)



**D. Individual and Society**

- **COMM 11** Fundamentals of Interpersonal Communication (3 Credits)

**E. Scientific World**

- **PHY 11** College Physics I (4 Credits)

**B, C. 3 credits of Humanities Restricted Electives<sup>1</sup>****SUBTOTAL 23****Major Requirements**

- **ACS 10** Introduction to Automotive Technology (1 Credits)
- **ACS 11** Engine Repair (4 Credits)
- **ACS 12** Brake Systems (3 Credits)
- **ACS 22** Automatic Transmission and Transaxle *OR* **ACS 38** Advanced Vehicle Diagnostics (4 Credits)
- **ACS 23** Heating and Air-Conditioning (3 Credits)
- **ACS 24** Electrical Systems (3 Credits)
- **ACS 35** Alternate Fuel Systems *OR* **ACS 36** Hybrid / Electric Vehicles (3 Credits)
- **ART 10** Art Survey *OR* **MUS 10** Music Survey *OR* **ACS 50** Automotive Technology Internship (1 Credit)

- **ELC 15** Computer Applications in Technology (2 Credits)
- **MTH 13** Trigonometry and College Algebra (3 Credits)
- **PEA** Physical Education Activity Course *OR* **WFA 10** Workplace First Aid (1 Credit)

**Automotive Technology Option Requirements**

- **ACS 13** Engine Performance (3 Credits)
- **ACS 14** Manual Drive Train and Axle *OR* **ACS 45** Diesel Technology (3 Credits)
- **ACS 21** Steering and Suspension Systems (3 Credits)

**Diesel Technology Option Requirements**

- **ACS 45** Diesel Technology (3 Credits)
- **ACS 46** Diesel Engine Performance (3 Credits)
- **ACS 47** Air Brakes and Suspension (3 Credits)

**SUBTOTAL 37**

<sup>1</sup> Three credits of Humanities Restricted Electives must be selected to fulfill Pathways Flexible Core Areas B or C. In order to get the broadest college experience, it is advised that the Humanities elective be chosen from disciplines OTHER THAN COMM, MEST, or HIS.



## Understanding Degree Program Requirements\*

Read the Automotive Technology program description on the BCC website. For each course listed, find and read the description in the College Catalog, then make your own conclusions about how it is relevant to Automotive Technology students.

- 1 English Composition (Required Core):** How will the required English courses help Automotive Technology professionals?

*Read the course descriptions for ENG110 and ENG 112 on p. 246 of the College Catalog to answer this question.*

- 2 Life and Physical Sciences (Required Core):** Why do you think this course is required?

*Read the course description for CHM11 or CHM17 on p. 231 of the College Catalog to answer this question.*

- 3 Individual and Society (Flexible Core):** How do you think this course relates to a career in Automotive Technology?

*Read the course description for COMM11 on p. 233 of the College Catalog to answer this question.*



\*RAENs will provide regional adaptations.



- 4 Should Automotive Technology students take **ACS 10 (Major Requirements)** in their first semester or in their last? Why?

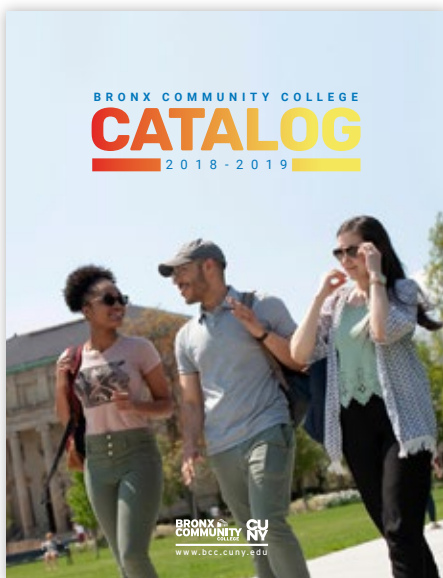
*Read the course description for ACS10 on p. 223 of the College Catalog to answer this question.*

- 5 What do students do in **ACS 23 (Major Requirements)**? Why is this required for Automotive Technology students?

*Use the course description for ACS 23 on p. 224 of the College Catalog to answer this question.*

- 6 Having learned about the Automotive Technology major, is this a career you would consider pursuing? Why or why not?





**Prerequisite:** MTH 5 or CUNY Math Proficiency  
**Corequisite:** ENG 2 or RDL 2  
*Required Core - Life and Physical Sciences*

AST 112 2 lect 1 rec 3 cr

### Planetary Astronomy

History of astronomy; ground-based observation and space exploration; physical processes in the solar system including the sun, planets and minor bodies; architecture of the solar system with emphasis on orbital motions, planetary surfaces, atmospheres and internal structures; formation and evolution of the solar system.

**Prerequisite:** ENG 2 or RDL2; MTH 5 or CUNY Math Proficiency  
*Flexible Core - Scientific World*

## Automotive Technology

### Engineering, Physics and Technology

ACS 10 3 lab 1 cr

#### Introduction to Automotive Technology

This course will introduce students to career choices in and basic skills related to, the automotive industry. Topics covered include basic shop safety, overview of electrical principles and automotive systems and proper use of tools and diagnostic instrumentation.

**Corequisites:** ENG 2, RDL 2, MTH 5, if required

ACS 11 2 rec 4 lab 4 cr

#### Engine Repair

A study of the modern internal combustion gasoline engine including basic principles of design and operation. This course covers disassembly, inspection and precision measuring and continues with reassembly including fitting and reconditioning parts. It also includes material covering engine support systems including cooling, lubrication and basic ignition system fundamentals and engine lubricants.

**Corequisite:** ACS 10

ACS 12 1 rec 4 lab 3 cr

#### Brake Systems

This course will study the design, operation and maintenance of the automotive brake system including diagnostics and servicing of rotors and drums, measuring and resurfacing. Anti-lock brake systems, traction control systems and front wheel drive axle shaft service are also covered.

**Corequisite:** ACS 10

ACS 13 2 rec 2 lab 3 cr

#### Engine Performance

This course begins with engine operation including conventional ignition systems and focuses on modern ignition techniques, engine, transmission and body control systems and other computer control systems. It explores modern diagnostic test techniques, equipment and procedures and provides a thorough understanding of modern vehicle fuel control systems.

**Prerequisites:** ACS 11, ACS 24

ACS 14 1 rec 4 lab 3 cr

#### Manual Drive Train and Axle

This course covers both conventional rear-drive systems and front-drive configurations. It concentrates on transmission maintenance, service and repair and includes drive line service and repair of clutch, ring gear and pinion, differential case assembly, drive shaft, half shaft and four wheel drive systems.

**Prerequisites:** ACS 11, ACS 24

From <http://www.bcc.cuny.edu/wp-content/uploads/2018/10/college-catalog-2018-20191.pdf> page 223

# CUNY Certificate: Automotive Technician at Bronx Community College

Having researched degree programs, students will now learn about certificate programs by reading a description of a Transportation and Warehousing certificate offered at a CUNY campus and developing questions based on what they read.

## PREP

- Preview the video <https://www.youtube.com/watch?v=spztyqFarmY> on the Automotive Technician certificate program at Bronx Community College.
- Explore the Automotive Technician certificate program at BCC by going to [www.bcc.cuny.edu](http://www.bcc.cuny.edu), then click on **Academics**, then **Academic Programs**, then **Certificate Programs**, then **Automotive Technician**.
- Go to [mynextmove.org](http://mynextmove.org). Search for Automotive Technician using the Search Careers with Key Words function. Read about the Automotive Technician career, in preparation for having a class discussion about it.

## MATERIALS

- *Certificate in Automotive Technician at Bronx Community College\** handout
- A computer with a projector, if available

## EXPLAIN

- 1 Certificate programs can be credit-bearing or not, require one semester or many semesters of study, may be open to diploma-holders only or may be open to those have not yet earned diplomas. There is a lot of variation in certificate programs. In CUNY, most certificate programs are housed in the Continuing Education departments.\* As the needs of industries change, colleges are adding and updating certificate programs all the time. The most up-to-date information can be found through the Continuing Education offices of each campus.
- 2 We are going to look at one certificate program that is offered at one of the CUNY colleges. Descriptions of certificate programs are usually less detailed than descriptions of degree programs are, so after watching a short video about the program and reading the certificate program description, you will develop questions you have about it.





- 3 We're going to watch a short video about a certificate program for Automotive Technicians at Bronx Community College. **What does automotive mean?**

› *Relating to cars.*

**What do you think an Automotive Technician is?**

› *Someone who repairs and maintains cars.*

**Do you know any other words for automotive technicians?**

› *Car mechanics.*

**What kinds of tasks do Automotive Technicians or Car Mechanics perform at work?**

› *They identify and fix any car problems that come up; they change the oil and replace windshield wipers; they change tires; they perform maintenance on the car engine.*

- 4 We're going to watch a short video about the Automotive Technician certificate program at Bronx Community College. Take out a piece of paper and write the following question words going down the left side of the page, leaving a few lines between each, that you will fill in after you watch the video:

**Who**

**What**

**How**

**Why**

As you watch the video, keep an eye out for:

- **Who** is speaking in the video? There are several people. See how many you can remember. You don't need to record the names of the speakers, just their role in the program.
- **What** do students do in the program?
- **How** do the speakers in the video feel about the program?
- **Why** do they feel that way?

- 5 Play the video <https://www.youtube.com/watch?v=spztyqFarmY>. As students are watching the video, write the questions above on the board, for students to refer to once they are finished watching the video.
- 6 Play the video a second time, asking students to make special note of information that answers the questions on the board.

- 7 Now we're going to look at a description of the certificate program, by looking at a handout from the Bronx Community College website. Distribute the *Certificate in Automotive Technician at Bronx Community College\** program description. Ask students to read it and write down questions they would have about entering the program.
- 8 Discuss the questions as a class.
- 9 Using computers, if they are available, or students' phones if they are not, ask students to go to indeed.com, and in the search bar, enter Automotive Technician and your location. Scroll through the ads and come to a decision as a class about the pay range for Automotive Technicians in your area. **Are you surprised by this salary? Why or why not?**
- 10 Turn to a partner and discuss whether or not you would like to work as an Automotive Technician, and your reasons.
- 11 Share responses in a class discussion.



## Certificate in Automotive Technician at Bronx Community College

From [www.bcc.cuny.edu/wp-content/uploads/2018\\_certificates/automotive\\_mechanics\\_certificate.pdf](http://www.bcc.cuny.edu/wp-content/uploads/2018_certificates/automotive_mechanics_certificate.pdf)

### AUTOMOTIVE TECHNICIAN

Certificate Program | Department of Engineering, Physics and Technology

The Automotive Technician program is designed to develop basic automotive skills required for entry-level position in most automotive repair shops. The program integrates automotive theory with an emphasis on shop experience. Upon successful completion of this program, students receive a certificate and are encouraged to complete the requirements for the AAS degree in Automotive Technology.

Curriculum Coordinator: Mr. Clement Drummond

### AUTOMOTIVE TECHNICIAN CURRICULUM

30 Credits required for Certificate

#### Certificate Requirements

- ACS 10 Introduction to Automotive Technology (1 Credit)
- ACS 11 Engine Repair (4 Credits)
- ACS 12 Brake Systems (3 Credits)

- ACS 13 Engine Performance (3 Credits)
- ACS 14 Manual Drive Train and Axles *OR* ACS 45 Diesel Technology (3 Credits)
- ACS 21 Steering and Suspension (3 Credits)
- ACS 22 Automatic Transmission and Transaxle *OR* ACS 38 Advanced Vehicle Diagnostics (4 Credits)
- ACS 23 Heating and Air-Conditioning (3 Credits)
- ACS 24 Electrical Systems (3 Credits)
- ACS 35 Alternate Fuel Technology *OR* ACS 36 Hybrid/Electric Vehicles (3 Credits)

For information regarding gainful employment, please visit: <http://www.bcc.cuny.edu/Gainful-Employment-Disclosure/?page2=GedtAM>



# How Do I Enroll in CUNY?\*

## CERTIFICATES

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CUNY certificate programs are administered through the colleges' Continuing Education departments. Students should contact the college's Continuing Education office to determine if there are any prerequisites, as well as the cost, schedule, location, deadlines and other pertinent information. Many programs require a high school diploma or equivalency as a prerequisite, but some, such as home health aide, do not.

In addition to the programs that CUNY offers, there are a range of low-cost or free short-term certificate programs in New York City offered at community-based organizations.

## DEGREES

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Once students have received a high school diploma or equivalent, they may apply to a CUNY college. They should research which college they want to attend, in order to find the best fit for their needs and interests. Once they are accepted, they will take placement exams in Reading, Writing and Math, which will determine whether they are placed into credit or developmental (remedial) courses. Students who need remediation should consider enrolling in CUNY Start or CLIP to improve basic skills at a low cost.

### STEP 1: Research programs and colleges

There are many factors to consider when researching a college program, such as:

- *Does it offer the major I am interested in?*
- *Where is the college located and how will I get there?*
- *Can I afford the tuition, either through payment, financial aid or scholarships?*
- *Are classes offered at times that work for me?*
- *How much time will I need to devote to attending classes, commuting and class preparation, including reading, completing assignments, group projects, and preparing for exams?*

**STEP 2:** (May be concurrent to Step 1) **Earn high school or equivalent diploma.**

**STEP 3:** **Apply to CUNY through the college's Admission Office**, known as Direct Admit, or online through the college website. CUNY does not ask students about their legal residency status.

**STEP 4:** **Apply for Financial Aid**—Pell, the federal grant and TAP, the New York State grant, through the website, **[www.fafsa.gov](http://www.fafsa.gov)**

**STEP 5:** Once accepted, take **CUNY placement exams** in Reading, Writing and Math.

**STEP 6: If remediation is required, enroll in CLIP or CUNY Start.**

The CUNY Language Immersion Program is for students who are non-native English speakers and need to improve their reading and writing in English before enrolling in credit-bearing college courses.

CUNY Start is for fluent English speakers who need to improve reading, writing or math skills before enrolling in credit-bearing courses.

**STEP 7: Attend New Student Orientations.**

## Special Programs

Beginning college can be overwhelming to many new students. The following CUNY programs provide students with smaller settings and more individual attention, academic support, such as instructional immersion and tutoring, financial support, such as contributing to tuition, travel expenses and book costs, and personal and academic advisement.

### LOW COST PROGRAMS FOR STUDENTS WITH REMEDIAL NEEDS

**CLIP (CUNY Language Immersion Program)**—An intensive English as a Second Language (ESL) program for CUNY students who need to improve their academic English language skills. Classes meet five hours a day, five days a week, in day or evening sessions in all five boroughs.

**CUNY Start**—Provides intensive preparation in academic reading, writing, math, and advisement. An academic program with social supports, CUNY Start helps students prepare for college level courses and re-take placement exams in Reading, Writing and Math.

### FINANCIAL AND ACADEMIC SUPPORTS FOR DEGREE STUDENTS

**ASAP (Accelerated Studies in Associate's Programs)**—Helps associate degree students earn their degrees as quickly as possible, ideally within three years. ASAP includes a consolidated block schedule, cohorts by major, small class size, and requires full-time study. It also includes tuition waivers for financial aid-eligible students, textbook assistance, and monthly MetroCards.

**College Discovery**—Available to financially eligible students, College Discovery offers a pre-college summer program, tutoring, counseling and advisement, tuition assistance, book and materials stipends.

The above programs are university-wide programs. Individual CUNY colleges offer additional programs. Representatives are often available to present on panels or to classes.

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“I decided blacks should not have to experience the difficulties I have faced, so I decided to open a flying school and teach other black women to fly.”

— *Bessie Coleman*



At 23 years old, BESSIE COLEMAN, hearing about the World War I Air Force, decided to become a pilot. Denied entrance to flight school for being black, native American and a woman, she saved up money from her job as a manicurist to move to and attend flight school in France, where she became the first black woman to earn a pilot's license, in 1921.

Image: <https://cdn.quotesgram.com/small/42/40/1870846498-ColemanStamp.jpg>