MARS Tasks | Grade 4

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2	Shapes with Straws	2003	NO, GM	Prob. @ divisors, multiples in geo. figures
5	Number Trains	2003	PFA, NO	Prob. @ factors, multiples in toy trains
9	Hexagon Desks	2003	PFA	Find, analyze # of chairs needed, graph
13	Flower Arranging	2003	NP	Divide number into parts, conditions
17	Traveling to School	2003	DA, NO, NP	Use time schedule/table to solve problems
21	Saturday Afternoon	2004	DA, GM	Time schedule/table, compare, elapsed time
24	Chips and Soda	2004	DA, NO	Make, justify, predict using table/bar graph
28	Piles of Oranges	2004	PFA	Describe extend growing pattern of oranges
31	Symmetrical Patterns	2004	GM	Name shapes, identify, draw symmetry
34	Counting Feet	2004	NO, PFA	Poss. combo of animals, given # of feet
37	Fabric Designs	2005	GM	Identify shapes, complete sym designs
40	Squares and Circles	2005	PFA	Find, extend growing pattern
44	The Donut Party	2005	DA, NO	Use graph, explain reason
48	Circle Numbers	2005	NO, NP	Use numb. cards, find combinations
52	Line of Laundry	2005	NO, NP	Given # of clothes pins, find combos
55	**Overview of 2006 Tasks**			
56	What's My Number?	2006	NO	Use, write clues with multiples of 2-9
58	Cookies, Muffins, Brownies	2006	NO	Use x/ in context # of goods, packaged
61	Dinosaur Data	2006	DA	Bar graph, scales of 5, use x or -
64	Stars	2006	GM	Symmetry, area of shapes, tessellation
67	Bikes and Trikes	2006	PFA	Use x/+ in context multi-step problem
69	**Overview of 2007 Tasks**			
70	Looking at Patterns	2007	PFA	Pattern of doubling & subtr., explain
72	The Baker	2007	NO	Use x/ in context, justify solution
74	Stained Glass	2007	GM	Lines of symmetry, complex design
76	Dinosaurs and Dragons	2007	DA	Find error in transf data, line plot, bar gr
79	Picking Fractions	2007	NP	Pick equ. fractions from list, create own
82	**Overview of 2008 Tasks**			
85	Votes	2008	NO	Compare find total votes, weighted value
85	Roger's Rabbits	2008	PFA	Identify, extend pattern, give rules
88	Winning Lines	2008	NO	Magic square type prob., reason
90	Quilt Making	2008	GM	Name shapes, symmetry & angles
92	Sum Bugs	2008	NP	Use x/ in context, 3 or more constraints
94	**Overview of 2009 Tasks**			
95	Dragonflies	2009	NO	Use x/ in context, # parts, # dragonflies
97	Fair Play	2009	GM	Area, perimeter, half the rectangle
100	Mayan Numbers	2009	NO, PFA	Extend pattern, solve for value of symbol
103	Leapfrog Fractions	2009	NP	Equ. fractions adding to one whole
106	Texting	2009	DA	Read interpret construct line plots

NP=Number Properties
NO=Number Operations
PFA=Patterns Functions Algebra
GM=Geometry & Measurement
DA=Data Analysis

4th grade Task 1 Shapes with Straws

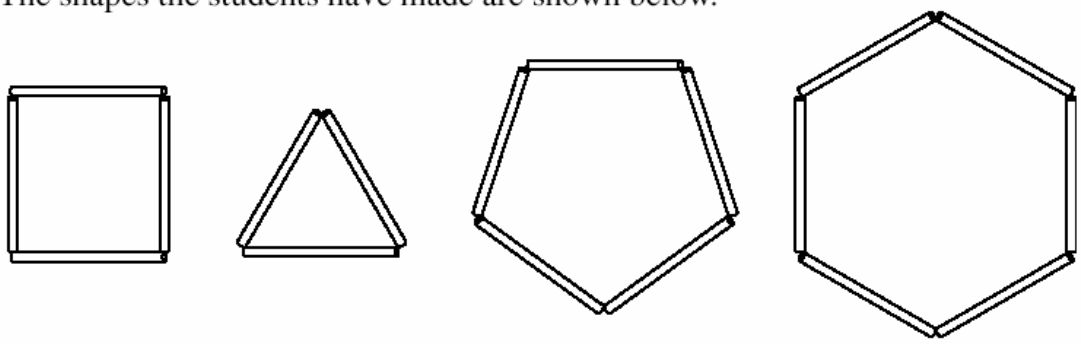
Student Task	Solve problems about divisors and multiples in a geometric context.
Core Idea 2 Number Operations	**Understand the meanings of operations and how they relate to each other, make reasonable estimates, and compute fluently.** • Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems
Core Idea 3 Geometry and Measurement	**Use characteristics, properties, and relationships of two-dimensional geometric shapes and apply appropriate techniques to determine measurements.** • Recognize geometric ideas and relationships and apply them to problems. (3rd grade) • Identify and compare attributes of two-dimensional shape and develop vocabulary to describe the attributes.

Fourth Grade

Shapes with Straws

This problem gives you the chance to:
• solve problems about divisors and multiples in a geometric context

Anna's class is making decorations using drinking straws. The students thread the straws together with string and then spray them with silver and gold paint. The shapes the students have made are shown below.



1. How many straws are needed to make these shapes?

square = _____ pentagon = _____

triangle = _____ hexagon = _____

2. Anna has 24 straws. How many decorations of each shape can she make?

_____ squares **or** _____ triangles **or** _____ hexagons **or** _____ pentagons

Explain how you figured this out.

_____

_____

_____

3. Anna's class wants to make 9 triangles and 5 hexagons. How many straws do the students need in all? Show how you figured this out.

_____

8

Fourth Grade- 2003

Shapes with Straws	**Test 4 Form A Rubric**	
The core elements of performance required by this task are: • solve problems about divisors and multiples in a geometric context Based on these, credit for specific aspects of performance should be assigned as follows:	**Points**	**Section Points**
1. Gives correct answers as: square = **4** triangle = **3** pentagon = **5** hexagon = **6** All four correct answers: 2 points *Partial credit:* Three or two correct answers: 1 point	2 (1)	2
2. Gives correct answers as: **6** squares or **8** triangles or **4** hexagons or **4** pentagons All four correct answers: 2 points *Partial credit:* Three or two correct answers: 1 point Gives explanation such as: I divided 24 by the number of sides in each shape. **or** I divided 24 by 4 then 3 then 6 then 5. *Accept repeated subtraction/addition strategies.* *Partitioning must use exactly 24 straws.*	2 (1) 1 **or** 1	3
3. Gives correct answer as: **57** Shows work such as: 9×3 or 27 5×6 or 30 $27 + 30 = 57$ *Allow 1 point for each correct multiplication if there is no blatant error in the explanation.*	1 2×1	3
Total Points		**8**

Fourth Grade

4th grade Task 2 Number Trains

Student Task	Solve problems about factors and multiples in a toy train context.
Core Idea 3 Patterns, Functions, and Algebra	**Understand patterns and use mathematical models to represent and to understand qualitative and quantitative relationships.** • Use inverse operations to solve multi-step problems • Understand and use the concept of equality
Core Idea 2 Number Operations	**Understand the meanings of operations and how they relate to each other, make reasonable estimates, and compute fluently.** • Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems

Fourth Grade

Number Trains

This problem gives you the chance to:
- solve problems about factors and multiples in a toy context

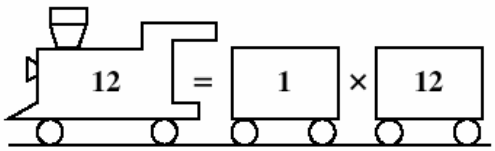
Sally is making number trains.
Each train has an engine and two boxcars.
Each engine and each boxcar has a number.

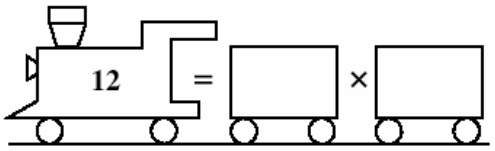
Each engine can pull two boxcars **only** when the product of the two boxcar numbers is equal to the engine number.

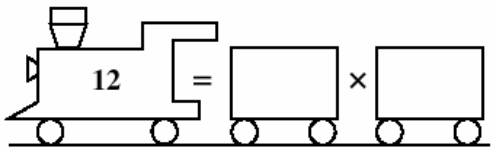
For example, engine number 12 can pull boxcars with numbers 1 and 12 because $12 = 1 \times 12$.

Put **different** pairs of numbers into the empty boxcars so that the engines can pull them. The first number train has been done for you.

1.







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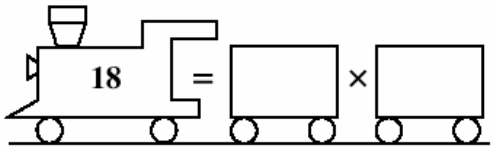
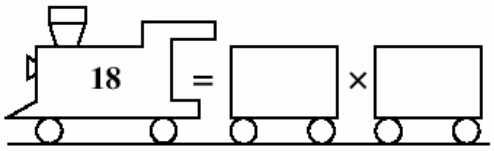
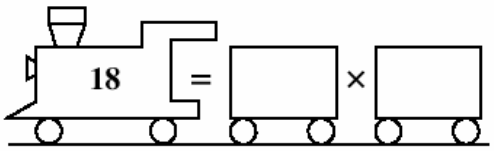
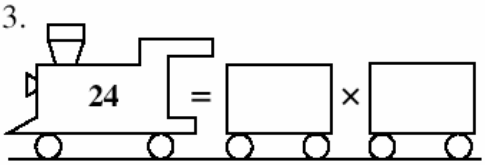


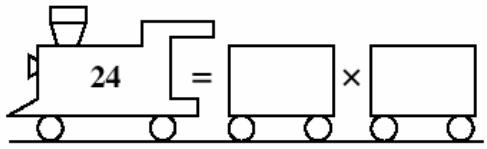


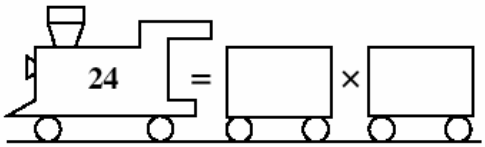


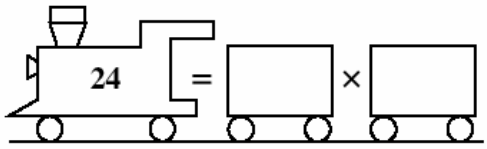
Fourth Grade- 2003

3.

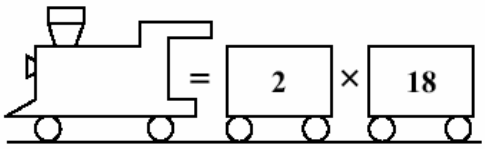








4. Two boxcars have the numbers 2 and 18.



What is the number of the engine that can pull these two boxcars?

_____

List the other 4 pairs of boxcar numbers that can be pulled by this engine.

(a) _____ × _____

(b) _____ × _____

(c) _____ × _____

(d) _____ × _____

Fourth Grade

Number Trains	**Test 4 Form A Rubric**	
The core elements of performance required by this task are: • solve problems about factors and multiples in a toy context Based on these, credit for specific aspects of performance should be assigned as follows:	**Points**	**Section Points**
1. Gives correct answers as: **(2, 6)** **(3, 4)** Both answers correct: 1 point	1	1
2. Gives correct answers as: **(1, 18)** **(2, 9)** **(3, 6)** All three correct answers: 2 points *Partial credit:* Two or one correct answers: 1 point	2 (1)	2
3. Gives correct answers as: **(1, 24)** **(2, 12)** **(3, 8)** **(4, 6)** All four correct answers: 2 points *Partial credit:* Three or two correct answers: 1 point	2 (1)	2
4. Gives correct answer as: Engine Number = **36** Gives correct answers as: **(1, 36)** **(3, 12)** **(4, 9)** **(6, 6)** All four correct answers: 2 points *Partial credit:* Three or two correct answers: 1 point	1 2 (1)	3
Total Points		**8**

4th grade Task 3 Hexagon Desks

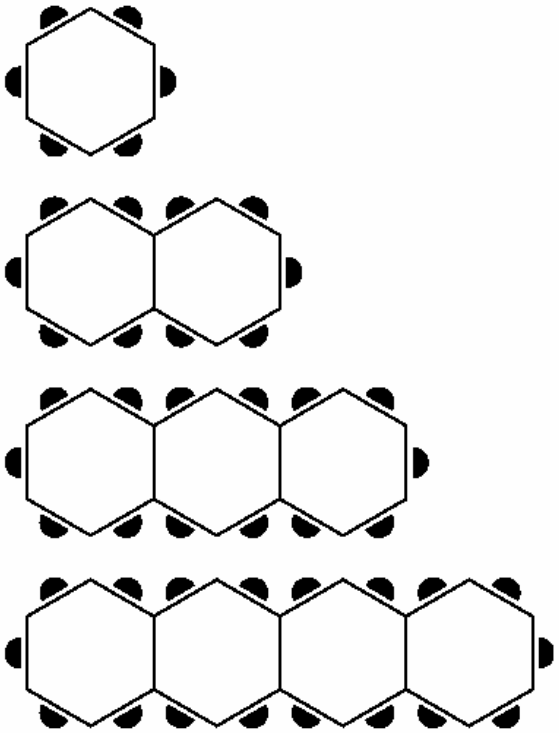
Student Task	Find, extend, and analyze a number pattern involving chairs placed around hexagonal desks. Plot and use a graph to display the number pattern information.
Core Idea 3 Patterns, Functions, and Algebra	**Understand patterns and use mathematical models to represent and to understand qualitative and quantitative relationships.** • Represent and analyze patterns and functions using words, tables, and graphs • Find the results of a rule for a specific value • Use concrete, pictorial, and verbal representations to solve problems involving unknowns.

Fourth Grade

Hexagon Desks

This problem gives you the chance to:
- find and extend a number pattern
- plot and use a graph

Sarah finds how many students can sit around a row of desks. The top surface of each desk is a hexagon, and the hexagons are arranged in rows of different shapes.



1 desk 6 students

2 desks 10 students

3 desks 14 students

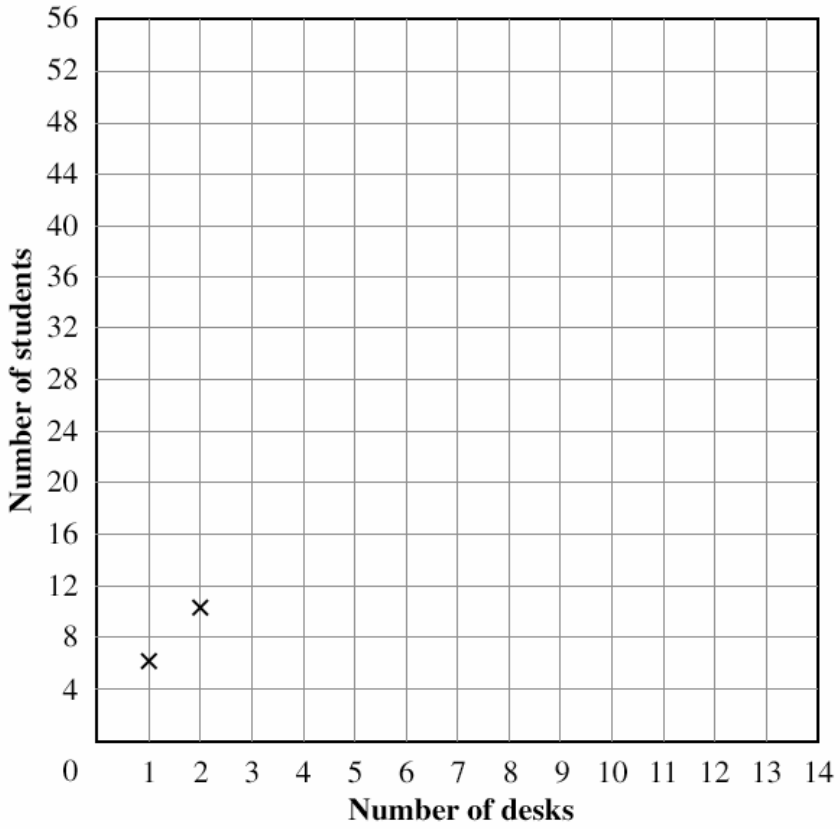
4 desks

1. Complete Sarah's table.

Number of desks in a row	Number of students
1	6
2	10
3	
4	
5	
6	

Fourth Grade- 2003

2. On the grid, plot the results from the table you completed in question 1.
The first two points have already been plotted for you.



3. Sarah says that 47 students can sit around a row of 11 desks.
Without drawing the desks, explain how you know that Sarah is wrong.

_____

_____

_____

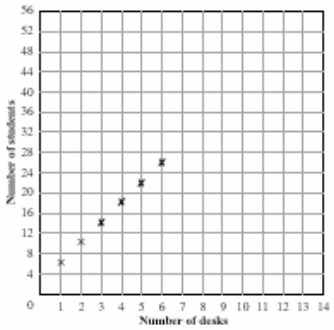
_____

How many students can sit around a row of 11 desks? _____

10

Fourth Grade

Hexagon Desks — Test 4 Form A Rubric

The core elements of performance required by this task are: • find and extend a number pattern • plot and use a graph Based on these, credit for specific aspects of performance should be assigned as follows:	Points	Section Points
1. Correctly completes the table: **Number of desks in a row** / **Number of students** 1 / 6 2 / 10 3 / **14** 4 / **18** 5 / **22** 6 / **26** All four correct values: 2 points *Partial credit:* Three or two correct values: 1 point	2 (1)	2
2. Correctly plots the four values from the student's answer to question 1 on the grid:  *Accept points in the correct square that are not on the horizontal grid lines.*	4 × 1 ft	4
3. Correctly continues table or graph. **or** States that 47 is not an even number. **or** Gives a correct alternative reason. Gives correct answer as: **46** students	2 **or** 2 **or** 2 2	4
Total Points		**10**

Fourth Grade- 2003

4th grade Task 4 Flower Arranging

Student Task	Divide a number into parts in order to satisfy given conditions with regard to arranging flowers.
Core Idea 1 **Number Properties**	**Understand numbers, ways of representing numbers, relationships among numbers, and number systems.** • Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers (3rd grade) • Develop understanding of the relative magnitude of whole numbers and the concepts of sequence, quantity, and the relative positions of numbers.

Fourth Grade- 2003

Flower Arranging

This problem gives you the chance to:
- figure out how many flowers are in an arrangement
- divide a number into parts in order to satisfy given conditions

Tim's grandmother loves flower arranging.

She always uses an odd number of each flower in each arrangement.

1. The arrangement she is making today has tulips, roses, and lilies.
Tim's grandmother uses 9 flowers in all.

There are more tulips in the arrangement than there are roses,
and there are more roses than lilies.

How many tulips are there? _____

How many roses are there? _____

How many lilies are there? _____

Explain how you figured this out.

_____

_____

_____

_____

Fourth Grade

2. The next arrangement Tim's grandmother makes also has tulips, roses, and lilies. She uses 11 flowers in all.

As before, she always uses an odd number of each flower in each arrangement.

There are more tulips in the arrangement than there are roses, and there are more roses than lilies.

How many tulips are there? _____

How many roses are there? _____

How many lilies are there? _____

Explain how you figured this out.

_____

_____

_____

_____

Fourth Grade- 2003

Flower Arranging — Test 4 Form A Rubric

The core elements of performance required by this task are: • figure out how many flowers are in an arrangement • divide a number into parts in order to satisfy given conditions Based on these, credit for specific aspects of performance should be assigned as follows:	Points	Section Points
1. Gives correct answers as: **5** tulips **3** roses **1** lily All three correct answers: 2 points	2	
Partial credit: Gives correct numbers of flowers but in incorrect order. **or** Gives correct order with two even numbers and the total is 9.	(1) **or** (1)	
Gives explanation such as: 1, 3, and 5 are the only 3 **different odd** numbers that add up to 9.	1	3
2. Gives correct answers as: **7** tulips **3** roses **1** lily All three correct answers: 2 points	2	
Partial credit: Gives correct numbers of flowers but in incorrect order. **or** Gives correct order with two even numbers and the total is 11.	(1) **or** (1)	
Gives explanation such as: 1, 3, and 7 are the only 3 **different odd** numbers that add up to 11.	1	3
Total Points		**6**

Fourth Grade

4th grade Task 5 Traveling To School

Student Task	Interpret a table of travel times. Use the information from this table to solve problems.
Core Idea 5 Data Analysis	**Collect, organize, represent and interpret numerical and categorical data, and clearly communicate their findings.** • Interpret data to answer questions about a situation
Core Idea 2 Number Operations	Reason about and solve problem situations that involve more than one operation in multi-step problems.
Core Idea 1 Number Properties	**Understand numbers, ways of representing numbers, relationships among numbers, and number systems.** • Use models, benchmarks, and equivalent forms to judge the size of friendly fractions

Fourth Grade- 2003

Traveling to School

This problem gives you the chance to:
- interpret a table of times and solve problems

Dave, Angela, Mark, and Carrie are all brothers and sisters.

They all go to the same school.

They leave home at the same time, but they travel in different ways.

Look at the chart to see how they travel and how long they take.

Student	Way of traveling	Time taken in minutes
Dave	walks	30
Angela	bicycles	15
Mark	by car	6
Carrie	by bus	9

1. Who arrives at school first? _____

   Who arrives at school last? _____

2. How much longer does it take Angela than Carrie to get to school?

   _____ minutes

3. Carrie decides to travel by car instead of by bus.
   How much time does she save? _____ minutes

4. Dave walks halfway to school. He remembers that he forgot his lunch. He walks back home to get it. He then leaves home to walk to school once more.

How long does it take Dave to walk to school today?

_____ minutes

Show your work.

5. Tomorrow Dave will run to school.
Estimate how long it will take him to do this. _____ minutes

Explain your answer.

_____

_____

_____

Fourth Grade- 2003

Traveling to School	**Test 4 Form A Rubric**	
The core elements of performance required by this task are: • interpret a table of times and solve problems Based on these, credit for specific aspects of performance should be assigned as follows:	**Points**	**Section Points**
1. Gives correct answers as: **Mark** **Dave** Both answers correct: 1 point	1	1
2. Gives correct answer as: **6** minutes	1	1
3. Gives correct answer as: **3** minutes	1	1
4. Gives correct answer as: 60 minutes (or **1 hour**) Shows work such as: 15 minutes takes him halfway to school 15 minutes takes him back home 30 minutes is the time he takes to walk to school **or** 15 + 15 + 30 = 60 minutes (or 1 hour)	1 2 **or** 2	3
5. Accept estimates **between 15 and 25 minutes.** Gives reasons based on the data such as: He would be quicker than if he walked, but slower than if he cycled. **or** Gives an explanation that includes reference to speed, rate, or time.	1 1 **or** 1	2
	Total Points	**8**

Fourth Grade

4th grade Task 1 Saturday Afternoon

Student Task	Given a table of time information, solve problems involving the comparison of time, the doubling time and elapsed time.
Core Idea 5 Data Analysis	**Collect, organize, represent and interpret numerical and categorical data, and clearly communicate their findings.** • Interpret data to answer questions about a situation.
Core Idea 4 Geometry and Measurement	**Apply appropriate techniques to determine measurement.** • Choose appropriate units and use these units to measure time.

Fourth Grade – 2004

Saturday Afternoon

This problem gives you the chance to:
• interpret information given in a table
• choose and use operations with time

Here is what our family does on Saturday afternoon.

Family member	Activity	Time
Mom	shopping	55 minutes
Joe	plays baseball	3 hours 20 minutes
Dad	mows the lawn	1 hour 45 minutes
Grandpa	plays chess	2 hours 30 minutes
Beth	skates	1 hour 35 minutes

1. Which activity takes the shortest time? _____

2. Dad begins to mow the lawn at the same time as Grandpa plays chess.
   Who finishes first?

   _____

3. Next week Beth plans to spend twice as much time skating.
   For how much time will she skate?

   _____ hours _____ minutes

   Show your calculation.

4. Joe begins playing baseball at 1:45 p.m.
   At what time will he finish playing baseball? _____
   Show how you figured it out.

Fourth Grade –2004

Saturday Afternoon	Test 4 Rubric	
The core elements of performance required by this task are: • interpret information given in a table • choose and use operations with time Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **shopping**	1	1
2. Gives correct answer: **Dad**	1	1
3. Gives correct answer: **3** hours **10** minutes Shows work such as: 2 x 1 hour 35 minutes **or** 2 hours 70 minutes	1 1	2
4. Gives correct answer: **5:05** p.m. Do not accept 5:5 p.m. *Partial credit* Gives answer: 4:65 p.m. Shows work such as: 1: 45 + 3 hours 20 minutes.	2 (1) 1	3
Total Points		7

Fourth Grade – 2004

4th grade Task 2 Chips and Soda

Student Task	Read and interpret information from a bar graph. Read and complete a frequency table and bar graph representing the same data. Make and justify a prediction based on this data.
Core Idea 5 Data Analysis	**Collect, organize, represent and interpret numerical and categorical data, and clearly communicate their findings.** • Represent data using tables, charts, line plots, and bar graphs. • Interpret data to answer questions about a situation.
Core Idea 2 Number Operations	• Understand division as the inverse operation of multiplication, the operation of sharing, partitioning, repeated subtraction, and an operation to determine rates.

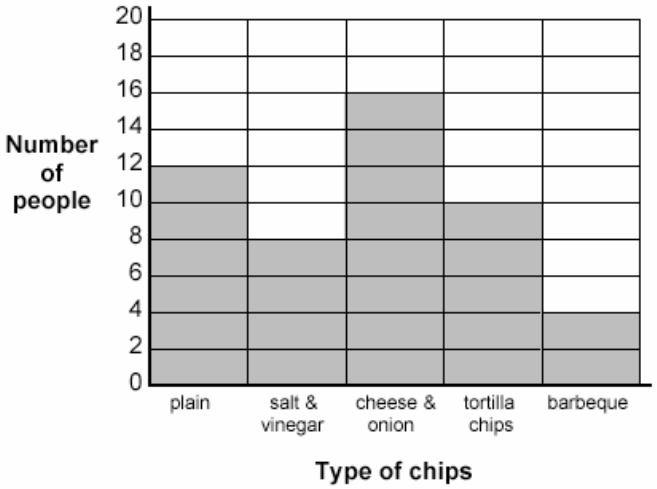
Fourth Grade – 2004

Chips and Sodas

This problem gives you the chance to:
- read and interpret bar graphs
- calculate frequencies from tallies
- draw a bar graph from given data

Damian and Sarah are doing a survey.
They want to know what type of chips and drinks people like best.

1. Damian has drawn this bar graph showing the data he has collected.



(a) What type of chips does the largest group of people in the survey like best?

_____

(b) How many people like tortilla chips best? _____

(c) How many people did Damian and Sarah survey? _____

(d) How many more people like plain chips than like barbeque chips?

_____

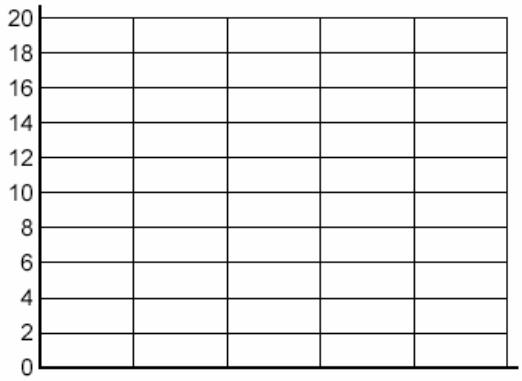
Fourth Grade –2004

2. Sarah has written her data on a recording sheet.

DRINKS	TALLY	TOTAL
lemonade	𝍸	5
cola	𝍸 𝍸 𝍸 |	16
flavored water	𝍸 𝍸 ||||	
orange	𝍸 𝍸 |	
root beer	||||	4

(a) Fill in the two missing totals on Sarah's recording sheet.

(b) Draw a bar graph showing Sarah's data. Remember to label the axes.



Sarah is inviting 25 people to a party.

3. Using her data, how many cola drinks should she buy? _____

Explain how you figured it out.

_____

_____

10

Fourth Grade – 2004

Chips and Sodas	Test 4 Rubric	
The core elements of performance required by this task are: • read and interpret bar graphs • calculate frequencies from tallies • draw a bar graph from given data Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
Gives correct answers: 1a. **cheese and onion**	1	
1b. **10**	1	
1c. **50**	1	
1d. **8**	1	4
Gives correct answers: 2a. **14** and **11**	1	
2b. Labels both axes.	1	
4 or 5 bars filled in correctly (5, 16, 14, 11, 4).	2 ft	
Partial credit 2 or 3 bars filled in correctly.	(1ft)	
Allow follow through from answers to 2a. Allow a different order of drinks only if correctly labelled.		4
3. Gives correct answer: **8**	1	
Provides a correct explanation such as: 16 out of 50 people like cola best so 8 out of 25 people may like cola best.	1	2
Total Points		**10**

Fourth Grade –2004

4th grade Task 3 Piles of Oranges

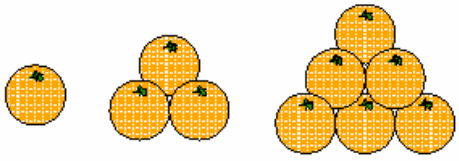
Student Task	Describe, extend and make generalizations about a growing pattern of oranges that are displayed in a grocery store.
Core Idea 3 Patterns, Functions, and Algebra	**Understand patterns and use mathematical models to represent and to understand qualitative and quantitative relationships.** • Represent and analyze patterns and functions using words, tables, and graphs. • Find the results of a rule for a specific value. • Use inverse operations to solve multi-step problems. • Use concrete, pictorial, and verbal representations to solve problems involving unknowns.

Fourth Grade – 2004

Piles of Oranges

This problem gives you the chance to:
• describe, extend and make generalizations about a number pattern

Here are some piles of oranges that are displayed in Mrs. Chang's grocery store.



	pile # 1	pile # 2	pile # 3	pile # 4
number of oranges	1	1 + 2 = 3	1 + 2 + 3 = 6	

1. Draw pile # 4 of oranges next to pile # 3 in the diagram above.

2. How many oranges are needed for pile # 4 and pile # 5?
   Write your answers in the table below.

Pile #	1	2	3	4	5
Number of oranges	1	3	6		

3. How many oranges does Mrs. Chang need for pile # 6? _____
   Show how you figured it out.

4. Mrs. Chang says, "I need 44 oranges to make pile # 9 ".
   Without drawing a diagram, explain how you know that she is wrong.

_____

_____

_____

5. How many oranges does she need to make pile # 9? _____

8

Fourth Grade –2004

Piles of Oranges	Test 4 Rubric	
The core elements of performance required by this task are: • to describe, extend and make generalizations about a number pattern Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Draws a correct diagram for pile # 4.	2	2
2. Gives correct answers **10** and **15** and writes these numbers in the table.	1, 1	2
3. Gives correct answer: **21** Shows work such as: 1 + 2 + 3 + 4 + 5 + 6 = 21 Accept adding on 6 from pile # 5: 15 + 6 **or** Draws a correct diagram to show pile # 5.	1 1 **or** 1	2
4. Gives a correct explanation such as: In pile # 9, the number of oranges is 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = 45. Accept adding on from, say, pile # 6.	1	1
5. Gives correct answer: **45**	1	1
Total Points		**8**

Fourth Grade – 2004

4th grade Task 4 Symmetrical Patterns

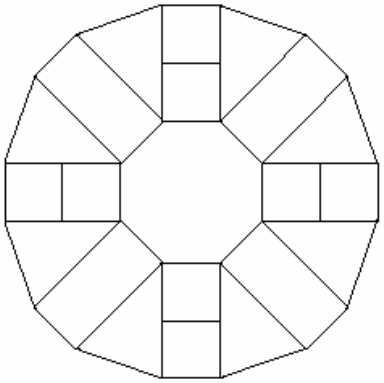
Student Task	Name the shapes found in a symmetrical pattern. Find lines of symmetry in one drawing and complete a different drawing to make it symmetrical.
Core Idea 4 Geometry and Measurement	**Use characteristics, properties, and relationships of two-dimensional geometric shapes. Examine, compare, and analyze attributes of geometric figures.** • Classify two-dimensional shapes according to their properties. • Understand line symmetry. • Investigate, describe, and reason about the results of combining and subdividing figures.

Fourth Grade –2004

Symmetrical Patterns

This problem gives you the chance to:
- name simple shapes
- work with symmetry

Saba makes this pattern using shape blocks.



1. Write the names of the shapes she uses.

_____

_____

_____

_____

2. This pattern is symmetrical.

   Draw in two of the lines of symmetry of this pattern.

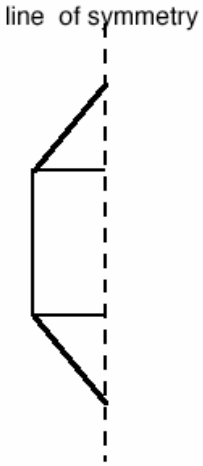
3. The diagram below shows half of a different symmetrical pattern that Saba makes.

   Draw the other half of her pattern.

   Write the names of the shapes in the pattern.

_____

_____



Fourth Grade – 2004

Symmetrical Patterns	Test 4 Rubric	
The core elements of performance required by this task are: • name simple shapes • work with symmetry Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answers: **Square, Rectangle, Triangle, Octagon** Allow 1 point for each correct shape. Minus 1 point for each shape after four.	1 x 4	4
2. Correctly draws two lines of symmetry on pattern.	1	1
3. Correctly completes the pattern.	2	
Partial credit Diagram partially correct.	(1)	
Gives correct answers for correct pattern only: **Triangle** and **Square/Rectangle** Accept trapezoid.	1	3
Total Points		**8**

Fourth Grade –2004

4th grade Task 5 Counting Feet

Student Task	Find the number of feet in the barn when given the number and kind of animals. Find the possible combinations of animals when given the total number of feet. Justify a conclusion based on the data.
Core Idea 2 Number Operations	**Understand the meanings of operations and how they relate to each other, make reasonable estimates, and compute fluently.** • Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems. • Develop fluency in multiplying whole numbers.
Core Idea 3 Patterns, Functions, and Algebra	**Understand patterns and use mathematical models to represent and to understand qualitative and quantitative relationships.** • Use inverse operations to solve multi-step problems. • Understand and use the concept of equality.

Fourth Grade –2004

Counting Feet

This problem gives you the chance to:
• solve number problems in a practical context

Sasha lives on a farm.
In the barn there are always at least one dog, one bird and one spider.

Dog  4 feet

Bird  2 feet

Spider  8 feet

1. Yesterday, there were 3 dogs, 4 birds and 2 spiders in the barn.
   How many feet were there in the barn? _____
   Show how you figured it out.

2. Today, Sasha counted 24 feet in all in the barn.
   How many dogs, birds and spiders do you think are in the barn today?
   There are four correct answers to this question. Try to find them all.

Number of dogs	Number of birds	Number of spiders

Explain how you know that there cannot be more than two spiders in the barn.

_____

_____

7

Fourth Grade – 2004

Counting Feet — Test 4 Rubric

The core elements of performance required by this task are:
- solve number problems in a practical context

Based on these, credit for specific aspects of performance should be assigned as follows

	points	section points
1. Gives correct answer: **36**	1	
Shows correct work such as: 3 x 4 + 4 x 2 + 2 x 8 = 12 + 8 + 16	1	2
2.		

Number of dogs	Number of birds	Number of spiders
1	6	1
1	2	2
2	4	1
3	2	1

Award 1 point for each correct row.	4 x 1	
or	**or**	
Award 1 point for showing that the total number of feet in each row is 24		
e.g., 4 + 12 + 8 = 24 4 + 4 + 16 = 24 8 + 8 + 8 = 24 12 + 4 + 8 = 24	4 x 1	4
3. Gives correct explanation such as: One dog and one bird have 6 feet. Two spiders have 16 feet. 6 + 16 = 22. There are only 2 feet left so there cannot be more than two spiders.	1	
Accept alternative correct explanations.		1
Total Points		7

Fourth Grade –2004

4th grade Task 1 Fabric Designs

Student Task	Identify geometric shapes in fabric designs and complete six different symmetrical designs.
Core Idea 4 Geometry and Measurement	**Use characteristics, properties, and relationships of two-dimensional geometric shapes. Examine, compare, and analyze attributes of geometric figures.** • Classify two-dimensional shapes according to their properties • Understand line symmetry and predict the results of sliding, flipping, or turning two-dimensional figures • Investigate, describe, and reason about the results of combining and subdividing figures

Fourth Grade – 2005

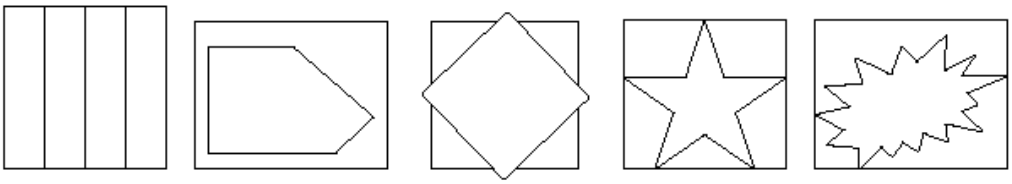
Fabric Designs

This problem gives you the chance to:
• recognize and create shapes that have symmetry

Tony and Chantelle design patterns that are printed onto fabric.

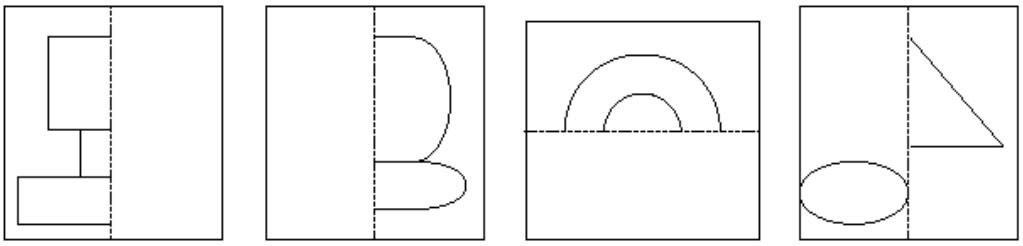
Chantelle's designs are always symmetrical. Tony's designs are never symmetrical. Here are some of their designs.

1. Draw a ring around those that Chantelle designed.



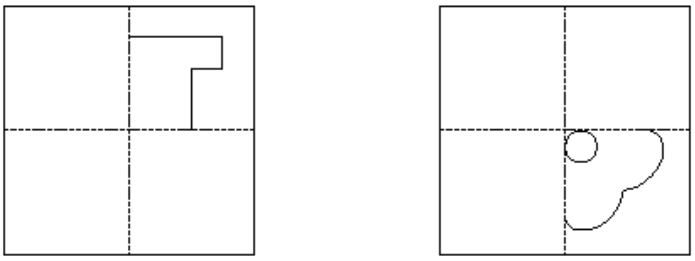
2. When Chantelle has an idea for a design, she jots it down and completes it later.

   When completed, these four designs have a line of symmetry.
   Complete these designs for Chantelle.

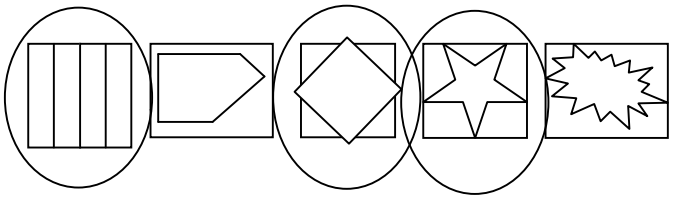
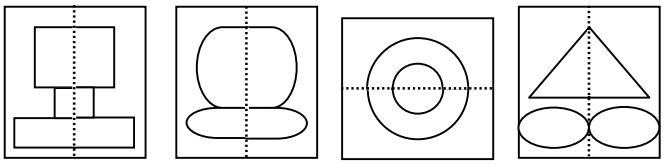
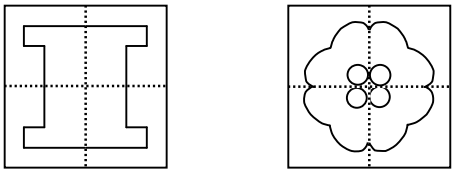


3. When completed, the two patterns below will have at least two lines of symmetry.

   Complete them for Chantelle.



8

Fabric Designs Grade 4		Rubric
The core elements of performance required by this task are: • recognize and create shapes that have symmetry Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Draws a ring around designs **a, c** and **d** with no incorrect designs ringed. (Accept rings around letters under the patterns.)  **Partial credit** Two correct answers no extras.	2 (1)	2
2. Award 1 point for each correctly completed design 	1x4	4
3. Award 1 point for each correctly completed design 	1x2	2
Total Points		**8**

4th grade Task 2 Squares and Circles

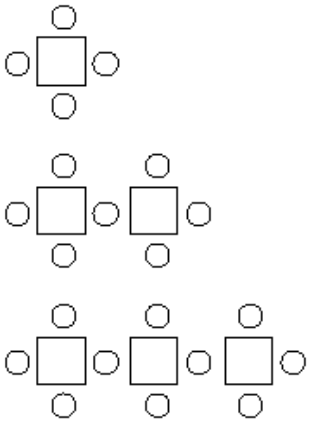
Student Task	Use a pattern of squares and circles to extend the design and answer questions about the number of each in relationship to the other. Show understanding using words and/or numbers.
Core Idea 3 Patterns, Functions, and Algebra	**Understand patterns and use mathematical models to represent and to understand qualitative and quantitative relationships.** • Represent and analyze patterns and functions using words, tables, and graphs • Find the results of a rule for a specific value • Use inverse operations to solve multi-step problems • Use pictorial and verbal representations to solve problems involving unknowns • Communicate mathematical thinking clearly and coherently

Fourth Grade – 2005

Squares and Circles

This problem gives you the chance to:
• find and use a pattern

Jack makes patterns using squares and circles.



1. Draw a diagram to show Jack's pattern using 4 squares.

Jack makes a table to show the number of circles he needs to make patterns using different numbers of squares.

Number of squares	1	2	3	4	5
Number of circles	4	7	10		

2. How many circles does Jack need to make a pattern using 4 squares?
   Write your answer in the table above.

3. How many circles does Jack need to make a pattern using 5 squares?
Write your answer in the table on the opposite page.
Explain how you figured it out.

_____

_____

_____

4. Jack makes a pattern using 10 squares.
How many circles does he use? _____

Show how you figured it out.

5. How many squares does Jack need to make a pattern that uses 40 circles?

_____

Explain how you figured it out.

_____

_____

_____

Squares and Circles Grade 4		Rubric
The core elements of performance required by this task are: • find and use a pattern Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Draws a correct diagram	1	1
2. Gives correct answer: **13**	1	1
3. Gives correct answer: **16** Gives a correct explanation such as: The number of circles increases in 3s.	1 1	2
4. Gives correct answer: **31** Shows correct work such as: 4 + 3 x 9 = 31 **or** counts on from, say 5 squares 16 + 3 + 3 + 3 + 3 + 3 = 31 Accept alternative correct calculations. Accept correct diagrams.	1 1	2
5. Gives correct answer: **13** Gives a correct explanation such as: The first square needs 4 circles and each extra square needs 3 circles. 40 – 4 = 36 36 ÷ 3 = 12 1 + 12 = 13 Accept alternative correct explanations.	1 1	2
Total Points		**8**

Fourth Grade – 2005

4th grade Task 3 The Donut Party

Student Task	Analyze a graph of favorite donut flavors to answer questions. Determine the amounts of donuts Sally should bring to her party and explain why not all friends will get their favorite donuts.
Core Idea 5 Data Analysis	**Collect, organize, represent and interpret numerical data and clearly communicate their findings.** • Interpret data to answer questions about a situation • Communicate mathematical thinking clearly and coherently
Core Idea 2 Number Operations	**Understand the meanings of operations and how they relate to each other, make reasonable estimates, and compute fluently.** • Understand division as the inverse operation of multiplication • Develop fluency with basic number combinations for multiplication and division

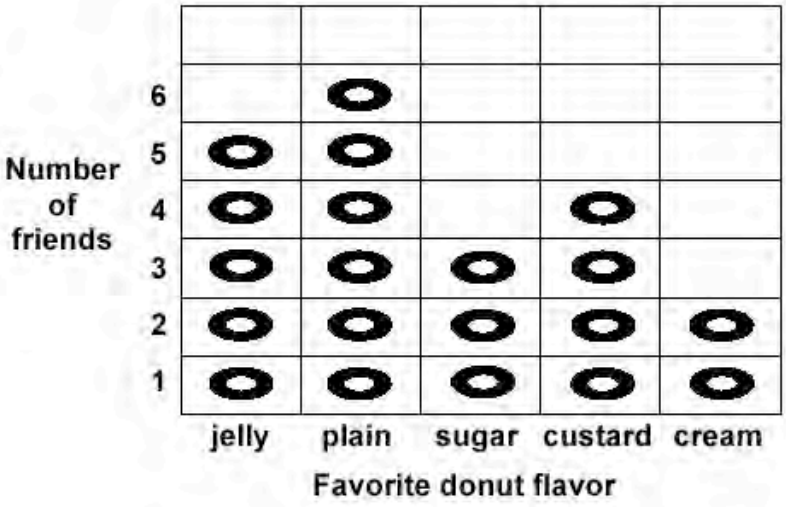
Fourth Grade – 2005

The Donut Party

This problem gives you the chance to:

- describe parts of the data and the set of data as a whole to determine what the data show about the questions

Sally and her friends are planning a donut party. She does a survey to find out which kind of donut each friend likes the best.
This graph shows what she found.



1. Which is the most popular donut? _____
2. Which is the least popular donut? _____
3. How many more people like jelly donuts than sugar donuts? _____

Fourth Grade – 2005

4. How many friends did Sally survey? _____

   Explain how you figured this out.

   _____

   _____

5. Sally wants each of her friends to have 3 of their favorite donuts.

   How many custard donuts should she buy? _____

   Show how you figured this out.

6. The shop only has 15 of each donut flavor.

   This creates a problem for Sally. Explain what Sally's problem is.

   _____

   _____

   _____

The Donut Party Grade 4		Rubric
The core elements of performance required by this task are: • describe parts of the data and the set of data as a whole to determine what the data show about the questions Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **plain**	1	1
2. Gives correct answer: **cream**	1	1
3. Gives correct answer: **2**	1	1
4. Gives correct answer: **20** Gives a correct explanation such as: I added all of the numbers: 5 + 6 + 3 + 4 + 2 With the correct answer accept: I counted all of the numbers.	1 1	2
5. Gives correct answer: **12** and Shows work such as: 4 x 3	1 1	2
6. Gives a correct explanation such as: Sally cannot buy 18 plain donuts, because the shop only has 15. Accept the shop does not have enough **plain** donuts.	1	1
Total Points		**8**

Fourth Grade – 2005

4th grade Task 4 Circle Numbers

Student Task	Using different sets of numbered playing cards, find combinations of cards that will build certain numbers.
Core Idea 2 Number Operations	**Understand the meanings of operations and how they relate to each other, make reasonable estimates, and compute fluently.** • Develop fluency with basic number combinations for multiplication and division
Core Idea 1 Number Properties	**Understand numbers, ways of representing numbers, relationships among numbers, and number systems.** • Understand whole numbers and represent their relationships in flexible ways

Fourth Grade – 2005

Circle Numbers

This problem gives you the chance to:
• use numbers in a flexible way

Omar and Jack enjoy playing card games.

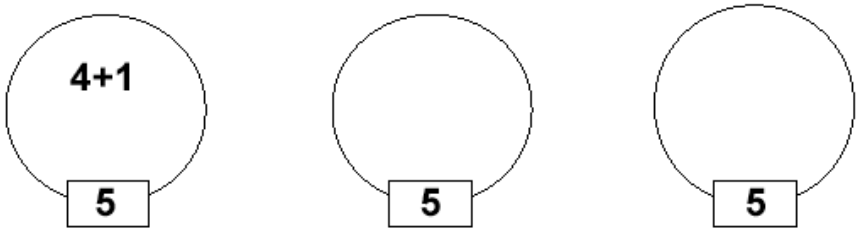
In the first game, they have five cards numbered 1 through 5.

They need to place the five cards in three circles so that the numbers in each circle have a total of 5.

All the cards must be used. They can only use each card once.

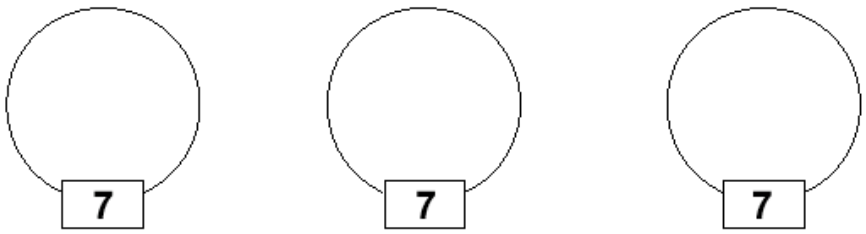
The first circle has already been done for you.

1. Write the numbers of the cards placed in the other two circles.



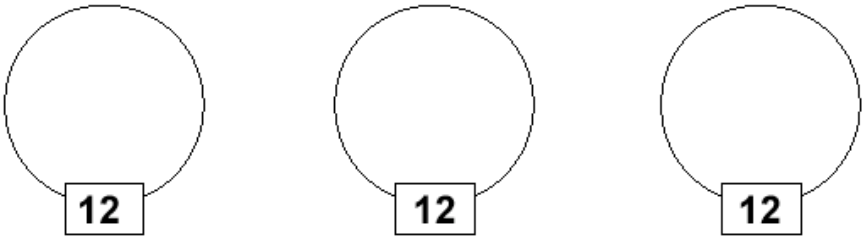
2. In the next game there are six cards, numbered 1 through 6.

Write the numbers of the cards placed in each of the three circles so that each circle has a total of 7.



3. a. In the next game there are eight cards, numbered 1 through 8.

The cards placed in each circle now need to have a total of 12.
Write the correct card numbers in each of the three circles.
You may place more than two card numbers in a circle.



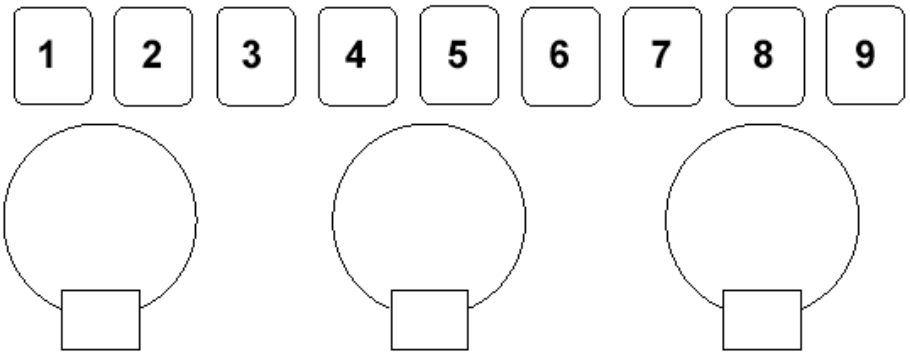
b. What is the total of the numbers on all of the eight cards? _____

Explain why the total number in each circle is 12.

_____

_____

4. In this game the children have nine cards, numbered 1 through 9.



Show how they can arrange the nine cards so that the cards in each circle have the same total. You may place more than two card numbers in a circle.

What is the total number in each circle? _____

Circle Numbers Grade 4		Rubric
The core elements of performance required by this task are: • use numbers in a flexible way Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **5** and **3 + 2**	1	1
2. Gives three correct answers: **6 + 1** and **5 + 2** and **4 + 3** *Partial credit* Two correct answers	2 (1)	2
3. 5 Shows one correct way of arranging the cards such as: 8 + 4 and 7 + 5 and 6 + 3 + 2 + 1 *Partial credit* Two correct answers 5 Gives correct answer: **36** Gives a correct explanation such as: I divided 36 by 3 and it made 12.	2 (1) 1 1	4
4. Shows an arrangement such as: 9 + 6 and 8 + 7 and 5 + 4 + 3 + 2 + 1 **or** 9 + 3 + 2 + 1 and 6 + 5 + 4 and 8 + 7 Gives correct total: **15**	1 1	2
Total Points		**9**

Fourth Grade – 2005

4th grade Task 5 Line of Laundry

Student Task	Determine how Daniel's granny will use clothes pins to hang her laundry on a washing line. Find out why Granny can only hang out 5 items at a time.
Core Idea 2 Number Operations	**Understand the meanings of operations and how they relate to each other, make reasonable estimates, and compute fluently.** • Develop fluency with basic number combinations for multiplication and division • Develop fluency with multiplying whole numbers • Communicate mathematical thinking clearly and coherently
Core Idea 1 Number Properties	**Understand numbers, ways of representing numbers, relationships among numbers, and number systems.** • Understand whole numbers and represent them in flexible ways including relating, composing, and decomposing numbers

Fourth Grade – 2005

Line of Laundry

This problem gives you the chance to:
- use numbers in a flexible way

Daniel's granny likes to dry her laundry on a washing line in the backyard.

She needs: 3 clothes pins for each T-shirt
4 clothes pins for each pair of jeans
6 clothes pins for each towel

1. How many clothes pins does she use when she hangs out one T-shirt, one pair of jeans and one towel? Show how you figured it out.

Granny only has 20 clothes pins. What can she hang on the line?

She must hang out at least one of each different item.

2. Find two different ways she can hang out five items.

	Number of items	Number of clothes pins
T-shirts		
Jeans		
Towels		
Total	5	

	Number of items	Number of clothes pins
T-shirts		
Jeans		
Towels		
Total	5	

3. Explain why she cannot hang out more than 5 items.

Line of Laundry Grade 4		Rubric
The core elements of performance required by this task are: • use numbers in a flexible way Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **13** Shows work such as: 3 + 4 + 6	1 1	2
2. ***Gives the following possible combinations:***	2x2	4
3. Gives a correct explanation such as: If granny puts one of each item on the line, she uses 13 clothes pins, and she only has 20 clothes pins. Using the 7 clothes pins she has left, she could hang out 2 more T-shirts. **or** 1 more T-shirt and 1 more pair of jeans. Accept: She doesn't have enough clothes pins	1	1
Total Points		**7**

	Number of items	Number of clothes pins
T-shirts	2	6
Jeans	2	8
Towels	1	6
Total	5	20

	Number of items	Number of clothes pins
T-shirts	3	9
Jeans	1	4
Towels	1	6
Total	5	19

Overview of Exam

Core Idea	Task
Number Operations	**What's My Number?**
The task asks students to use and to write clues involving multiplies to find a given number. Successful students can work with multiples of 2, 3,5,6,7, and 9. They understand order of numbers, such as larger and smaller. They can write explanations to show the logic of how a number fits a set of clues.	
Number Operations	**Cookies, Muffins & Brownies**
The task asks students to use multiplication and division to reason about packaging food for a school fair. Successful students can recognize multiplication situations and use multiplication to reason about students, each making groups of cookies, brownies or muffins, to find the total number of baked goods. Students could then use division to package the food into equal-size containers.	
Data Analysis	**Dinosaur Data**
The task asks students to relate a table of data to a bar graph and make comparison statements about data on the graph. Successful students could work with scales of 5's and reason about bars falling between the lines. Students could make conclusions about data and write comparison statements using multiplication or subtraction.	
Geometry and Measurement	**Stars**
The task asks students to work with symmetry and area of shapes in a tessellation. Successful students could reason about area and how half squares fit together to make a whole. Students could use spatial visualization to identify and shade hexagons in a larger design, identify attributes of shapes, and recognize shapes that have been rotated.	
Patterns, Functions, and Algebra	**Bikes and Trikes**
The task asks students to use solve number problems using multiplication and division in the context of wheels in a bicycle shop. Successful students could identify multiplication situations in context and multiply one-digit numbers with accuracy. They could reason about combining two groups of items and solve a multi-step problem involving multiplication and addition.	

What's My Number?

This problem gives you the chance to:
• solve "what's my number?" problems

Mandy and David play a number game.

My number is: smaller than 20
a multiple of 3
a multiple of 5

1. What is Mandy's number? _____
   Show how you figured it out.

My number is: larger than 20
smaller than 30
a multiple of 7
a multiple of 2

2. What is David's number? _____
   Show how you figured it out.

3. Mandy thinks of the number 18.
   Write three clues that will help David to guess her number correctly.

   _____

   _____

   _____

What's My Number	Rubric	
The core elements of performance required by this task are: •.solve "what's my number?" problems Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **15** Shows work such as: The multiples of 3 that are less than 20 are: 3, 6, 9, 12, **15**, 18 The multiples of 5 that are less than 20 are: 5, 10, **15** **or** Shows that 3 and 5 are factors of 15 e.g. 3 x 5 = 15	1 1 1 or 2	3
2. Gives correct answer: **28** Shows work such as: The multiples of 7 that are between 20 and 30 are: 21, **28** The multiples of 2 that are between 20 and 30 are: 22, 24, 26, **28** **or** Shows that 7 and 2 are factors of 28 *Partial credit* Gives a number larger than 20 and smaller than 30 that is a multiple of either 7 or 2	1 1 1 or 2 (1)	3
3. Makes two true statements. Makes a statement that makes the number 18 unique	2 x 1. 1	3
Total Points		**9**

Cookies, Muffins and Brownies

This problem gives you the chance to:
• solve number problems with multiplication and division in a real context

1. Four students bake cookies for the school fair.
   Each student bakes twelve cookies.
   They are going to sell the cookies in bags of three.
   How many bags do they need? _____ bags

   Show how you figured it out.

2. Five students bake muffins for the school fair.
   Each student bakes twenty muffins.
   They are going to sell the muffins in boxes of four.
   How many boxes do they need? _____ boxes

   Explain how you figured it out.

   _____

   _____

   _____

   _____

   _____

   _____

3. Ten students make brownies for the school fair.
   Each student makes six brownies.
   They put the same number of brownies in each of twelve boxes.
   How many brownies do they put in each box? _____

   Explain how you figured it out.

   _____

   _____

   _____

   _____

   _____

Cookies, Muffins and Brownies Rubric		
The core elements of performance required by this task are: • solve number problems with multiplication and division in a real context Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **16** Shows correct work such as: 12 x 4 = 48 **or** 12 ÷ 3 = 4 48 ÷ 3 = 4 x 4 = Accept repeated addition/subtraction or diagrams	1 1 1	3
2. Gives correct answer: **25** Gives correct explanations or shows that: 5 students bake 20 x 5 = 100 muffins, They need 100 ÷ 4 = 25 boxes. **or** Each student needs 20 ÷ 4 = 5 boxes, Five students need 5 x 5 = 25 boxes. Accept repeated addition/subtraction or diagrams	1 1 1 **or** 1 1	3
3. Gives correct answer: **5** Gives correct explanations or shows that: 10 students bake 10 x 6 = 60 brownies, In each box they put 60 ÷ 12 = 5 brownies. **or** Each student puts one brownie in 6 (half) of the boxes, Ten students put 5 brownies in twelve boxes. Accept repeated addition/subtraction or diagrams	1 1 1 **or** 1 1	3
Total Points		**9**

Dinosaur Data

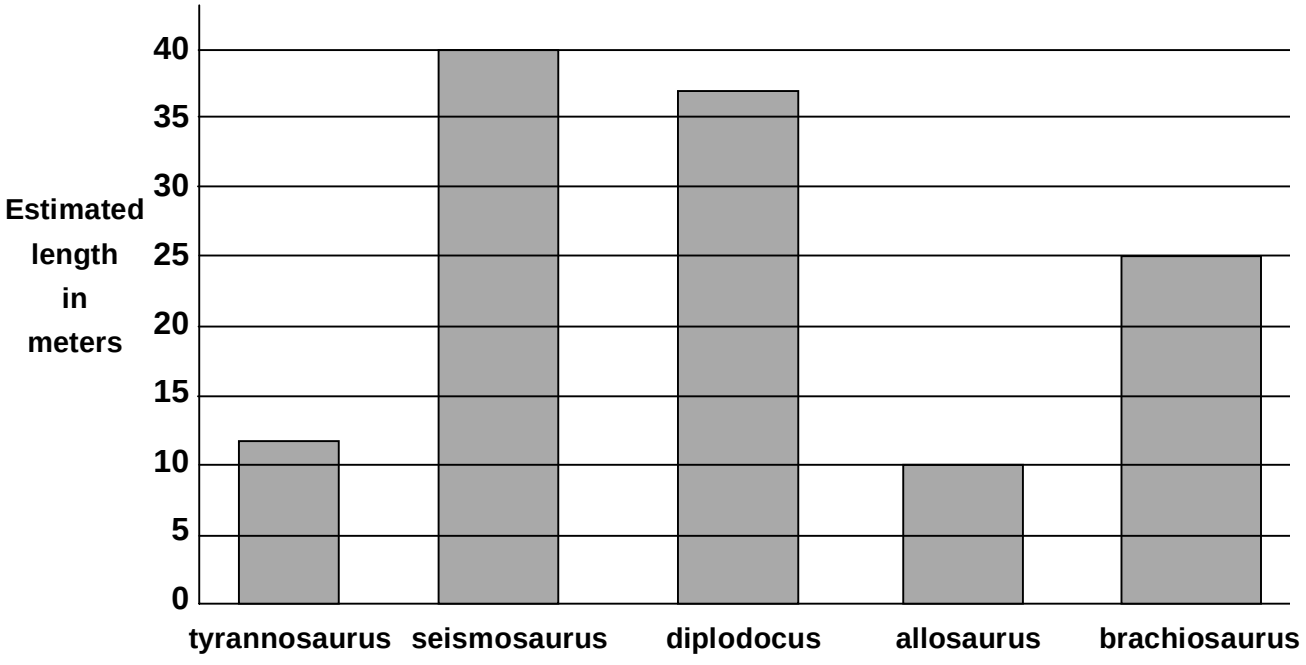
This problem gives you the chance to:
- relate a table of data and a bar graph
- derive information

Sangita and Zach are doing a project about dinosaurs.

They have discovered the facts shown in the table below.

Name of dinosaur	Food dinosaurs eat	Estimated length in meters
tyrannosaurus	meat	12
seismosaurus	plants	40
diplodocus	plants	27
allosaurus	meat	10
brachiosaurus	plants	25

They use the numbers in the table to draw this bar graph.



1. The students have made a mistake.
   One of the bars on the graph is wrong.

   Which one is it? _____

   Explain your answer.

   _____

   _____

2. Using the table on the opposite page, the students have written some information about these dinosaurs.

   One of the sentences is **not** correct. Underline the incorrect sentence.

   - A brachiosaurus can be about twice as long as a tyrannosaurus.
   - Meat eating dinosaurs are longer than plant eaters.
   - An allosaurus is shorter in length than a seismosaurus.

   Explain what is wrong with the information in the sentence you have underlined.

   _____

   _____

   _____

3. Using the facts on the opposite page, write two sentences of your own comparing the length of these dinosaurs.

   _____

   _____

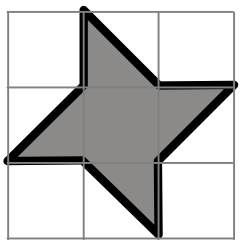
   _____

   _____

Dinosaur Data	Rubric	
The core elements of performance required by this task are: • relate a table of data and a bar graph • derive information Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **diplodocus**	1	
Gives correct explanation such as: On the bar chart this is recorded at about 37 (accept 36 to 38 inclusive) rather than 27 meters.	2	
Partial credit For a partially correct/inaccurate answer.	(1)	3
2. Underlines "Meat eating dinosaurs are longer than plant eaters".	1	
Gives correct explanation such as: From the table it would appear that the plant eating dinosaurs are longer than the meat eaters.	1	2
3. Writes correct statements such as: The seismosaurus is (about 15 meters) longer than the brachiosaurus. The shortest of these dinosaurs is the allosaurus.	1 1	2
Total Points		**7**

Stars

This problem gives you the chance to:
• work with symmetry and area of shapes in a tessellation



1. How many sides does this shaded star shape have?

   _____

2. Explain why the area of the star is 3 squares.

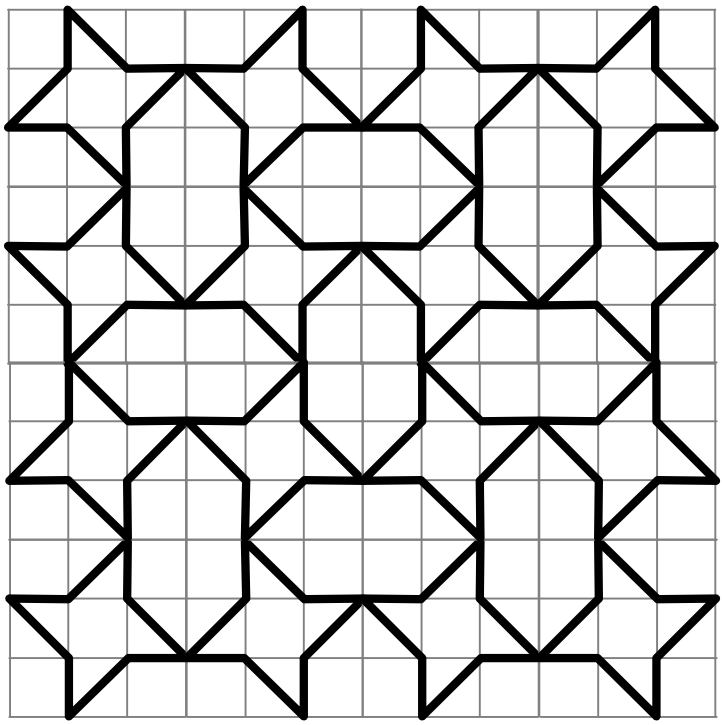
   _____

   _____

   _____

This pattern is made from lots of stars. Some of them are flipped.

Hexagons are made between the stars.



3. Shade three of the hexagons in the diagram.

4. How many stars are there in the diagram? _____

5. Is the area of the hexagon bigger or smaller than the area of the star?

   _____

   Explain how you figured it out.

   _____

   _____

   _____

Stars	Rubric	
The core elements of performance required by this task are: • work with symmetry and area of shapes in a tessellation Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **8**	1	1
2. Gives a correct explanation such as: There is one whole square and four half squares.	2	2
3. Shades three hexagons.	1	1
4. Gives correct answer: **16**	1	1
5. Gives correct answer: **bigger** **and** Explains that there are 4 whole squares and 4 half squares, or 6 whole squares	2	2
Total Points		**7**

Bikes and Trikes

This problem gives you the chance to:
• solve number problems in a real context

The cycle shop on Main Street sells bikes (two wheels) and trikes (three wheels).

1. Yesterday, Sarah counted all of the cycles in the shop.
   There were seven bikes and four trikes in the shop.
   How many wheels were there on these eleven cycles? _____
   Show your calculation.

2. Today, Sarah counted all of the wheels of all of the cycles in the shop.
   She found that there were 30 wheels in all.
   There were the **same number** of bikes as there were trikes.

   How many bikes were there? _____

   How many trikes were there? _____

   Show how you figured it out.

Bikes and Trikes	Rubric	
The core elements of performance required by this task are: • solve number problems in a real context Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **26** wheels Shows work such as: 7 x 2 and 4 x 3 14 + 12 = Accept repeated addition or diagrams	1 2	 3
2. Gives correct answers: **6** bikes **and 6** trikes Gives correct explanation such as: 6 bikes = 12 wheels 6 trikes = 18 wheels in all 30 wheels May list or draw diagrams 1 bike and 1 trike = 2 + 3 = 5 wheels 2 bikes and 2 trikes = 4 + 6 or 2 x 5 = 10 wheels 3 bikes and 3 trikes = 6 + 9 or 3 x 5 = 15 wheels 4 bikes and 4 trikes = 8 + 12 or 4 x 5 = 20 wheels 5 bikes and 5 trikes = 10 + 15 or 5 x 5 = 25 wheels 6 bikes and 6 trikes = 12 + 18 or 6 x 5 = 30 wheels	2 3	 5
Total Points		**8**

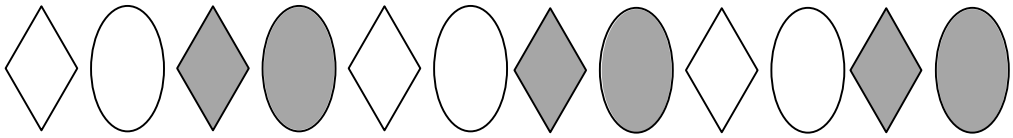
Fourth Grade Mars 2007 Task Descriptions
Overview of Exam

Core Idea	Task	Score
Algebra	**Looking at Patterns**	
The task asks students to follow a pattern for doubling and subtracting and find the resulting patterns. Students needed to show an understanding of odd and even. Successful students could describe repeating patterns and explain why the rules of the pattern produced odd numbers.		
Number Operations	**The Baker**	
The task asks students to use multiplication and division to reason about packaging baked goods into bakery boxes. Successful students could use division and reason about the remainder in a context. Successful students could justify which type of baked goods would exactly fill 8 boxes.		
Geometry	**Stained Glass**	
The task asks students to work with line symmetry. Students needed to draw in lines of symmetry in geometrical designs and find the number of lines of symmetry for a complex design. Successful students could also fill in missing parts of a design using lines of symmetry as clues.		
Data Analysis	**Dinosaurs and Dragons**	
The task asks students to identify an error made when transposing information from a line plot to a bar graph and to make their own bar graph from a frequency table . Successful students could also compare and contrast the data shown in the two bar graphs.		
Number Properties	**Picking Fractions**	
The task asks students to pick equivalent fractions from a given list and make their own equivalent fractions. To meet standards, students should be able to work with unit fractions like 1/2, 1/4, and 1/3. Successful students could also reason about fractions like 2/3 and 3/4.		

Looking At Patterns

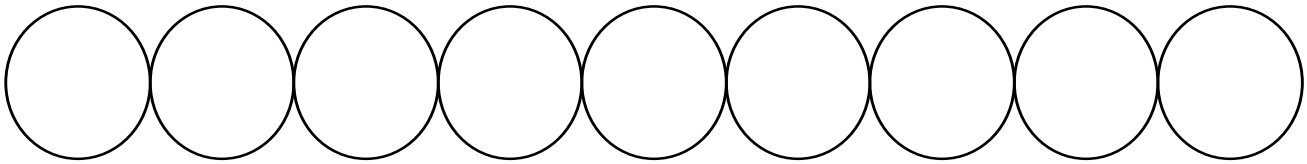
This problem gives you the chance to:
- recognize and use patterns

1. Here is part of a repeating pattern.



Draw the next 4 shapes in this pattern.

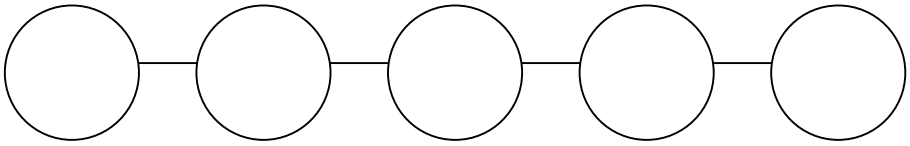
2. Here is a number pattern game. Write a number between 1 and 5 in the first circle.



Double the number and write it in the next circle.
Keep doing this, but if the number is more than 10 subtract 10 before you write the number in the next circle. Carry on until all the circles are full.

Describe what happens to the numbers in your pattern. _____

3. Here is another number pattern game.
Write a small odd number greater than 1 in the first circle.



Now follow this rule: Double the number, then subtract one.
Write this number in the second circle. Keep doing this until all the circles are full.

What pattern do you see in these numbers? _____
Explain why this happens.

_____

_____

Task 1: Looking at Patterns — Rubric

The core elements of performance required by this task are: • recognize and use patterns Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Draws the next four shapes correctly	1	1
2. Dependent on the starting number, produces pattern such as: 1 2 4 8 6 **2** **4** **8** **6** 1 2 4 8 16 6 12 **2** **4** 2 4 8 6 2 **4** **8** **6** **2** 3 6 2 4 8 **6** **2** **4** **8** 3 6 12 2 4 8 16 **6** **12** 4 8 6 2 **4** **8** **6** **2** **4** 4 8 16 6 12 2 **4** **8** **16** 5 10 20 **10** **20** **10** **20** **10** **20** *Partial credit* One error with correct follow through. Two errors. Gives correct explanations such as: The numbers repeat (dependent on a correct pattern).	3 (2) (1) 1	4
3 Dependent on the starting number, produces pattern such as the top line in the table. 3 5 9 17 33 3 6 5 10 11 Gives correct answer such as: They are all odd numbers. Gives correct explanations such as: The starting number was odd. By doubling an odd number get an even number, but you had to take one away. This means you have an odd number. So all the numbers are odd. **or** Gives second row of table and states: They are alternate odd and even. Gives explanation such as: Double an odd number gives an even number. Subtract one gives an odd number	1 1 1 or **1** **1**	**3**
Total Points		**8**

The Baker

This problem gives you the chance to:
• choose and perform number operations in a practical context

The baker uses boxes of different sizes to carry her goods.

Cookie boxes hold 12 cookies.
Donut boxes hold 4 donuts.
Muffin boxes hold 2 muffins.
Bagel boxes hold 6 bagels.
Bagel boxes hold 4

1. On Monday she baked 24 of everything.
   How many boxes did she need? Fill in the empty spaces.
   cookie boxes _____ donut boxes _____
   muffin boxes _____ bagel boxes _____

2. On Tuesday she baked just bagels. She filled 7 boxes.
   How many bagels did she make? _____
   Show your calculations.

3. On Wednesday she baked 42 cookies.
   How many boxes did she fill? _____
   How many cookies were left over? _____
   Explain how you figured this out.

   _____

   _____

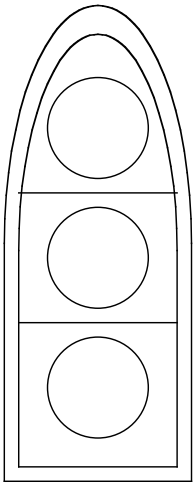
4. On Thursday she baked 32 of just one item and she filled 8 boxes.
   What did she bake on Thursday? _____
   Show how you figured this out.

Task 2: The Baker		Rubric
The core elements of performance required by this task are: • choose and perform number operations in a practical context Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answers: **2** cookie boxes **6** donut boxes **12** muffin boxes **4** bagel boxes	1x4	4
2. Gives correct answer: **42** Shows **6 x 7 = 42**. Accept repeated addition.	1 1	2
3. Gives correct answers: **3** **6** Gives a correct explanation such as: She filled 3 complete boxes: 3 x 12 = 36 and 42 – 36 = 6. This means that 6 were left over **or** Shows 42 ÷ 12 = 3, remainder 6.	1 1	2
4. Gives correct answer: **donuts** Shows work such as: 4 x 8 = 32 Accept diagrams.	1 1	2
Total Points		**10**

Stained Glass

This problem gives you the chance to:
- work with line symmetry

Maddie loves the symmetrical designs in stained glass windows.

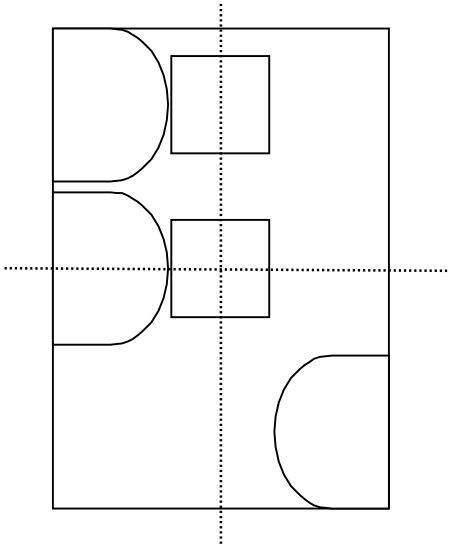


1. Here is one design that she likes.
   Draw in the line of symmetry for Maddie.

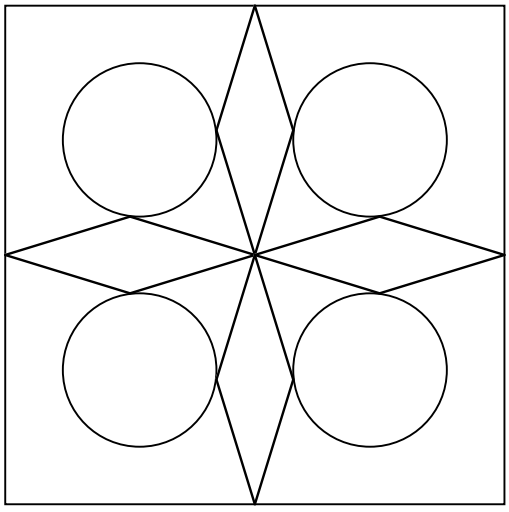
2. Maddie has begun to draw a window with two lines of symmetry.

   The dot lines (⋮ .....) show the two lines of symmetry.

   Complete the drawing so that it is symmetrical.



3. This window is Maddie's favorite.



How many lines of symmetry does this design have?

_____

Draw in all the lines of symmetry.

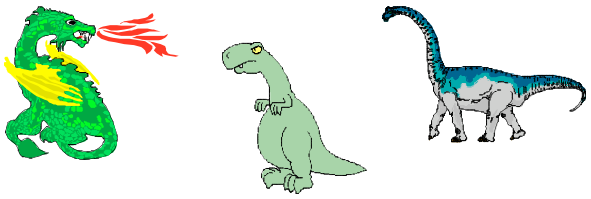
6

Task 3: Stained Glass	Rubric	
The core elements of performance required by this task are: • work with line symmetry Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Draws a correct line of symmetry with no extras.	1	1
2. Completes the design correctly. *Partial credit* One or two errors	2 (1)	2
3 Gives correct answer: **4** Draws all 4 lines of symmetry with no extras *Partial credit* Draws two correct lines of symmetry with no extras**.**	1 2 (1)	3
Total Points		**6**

Dinosaurs and Dragons

This problem gives you the chance to:
- draw graphs and interpret data

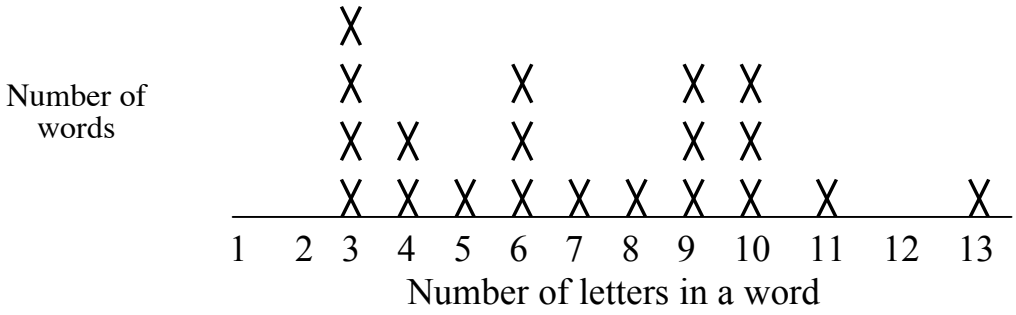
Adam likes learning about dinosaurs.
Jade loves reading about dragons.



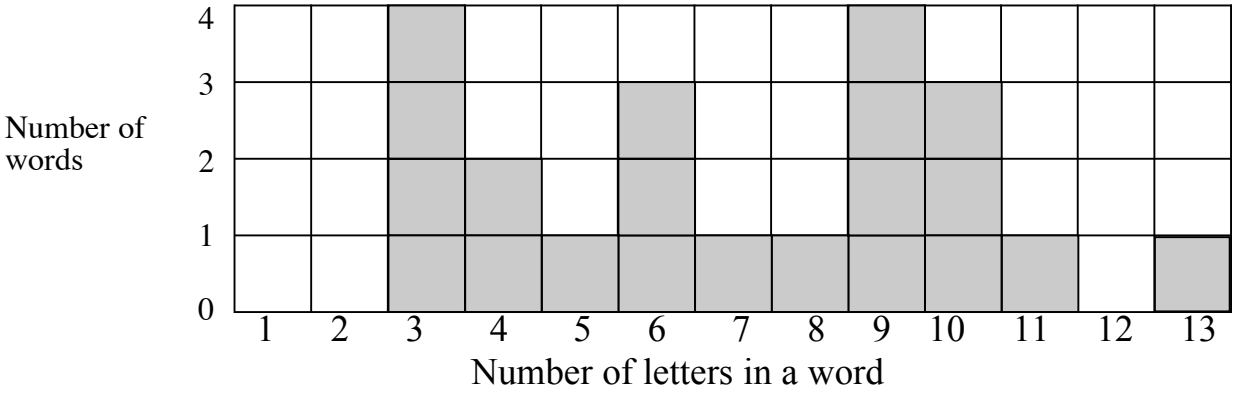
Adam read this today.

The diplodocus, tyrannosaurus, stegosaurus and allosaurus were dinosaurs, mighty creatures that inhabited planet earth during the Jurassic and Cretaceous periods.

Adam likes long words, so he made this line plot to show the length of each word in the box above.



Adam also recorded the length of the words as a bar graph.



1. Adam has made one mistake on his bar graph.
   Write an X on the mistake he has made.

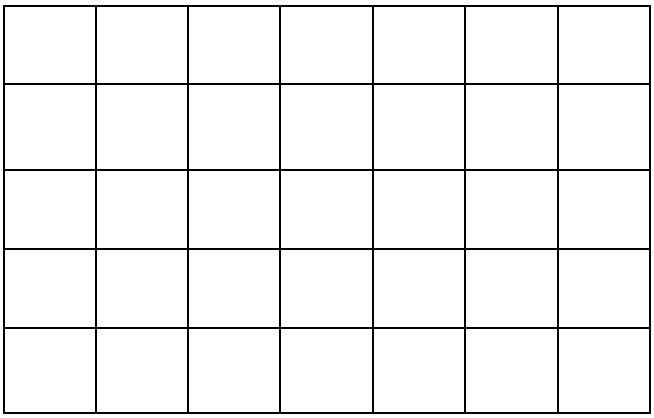
2. Jade reads this in her dragon book.

> **In the hills lived a green, sad dragon. Nobody visited his lair, as they were afraid of his red eyes.**

Here is a table to show the number of words of different lengths in Jade's book.

Number of letters in a word	1	2	3	4	5	6	7
Number of words	1	3	5	4	3	3	1

Make a bar graph using this data. Remember to label the axes.



3. Look at the data shown in the two bar graphs.

a. Write one thing about the data that is the same in both bar graphs.

_____

_____

b. Write **two** things about the data that is different in the two bar graphs.

_____

_____

_____

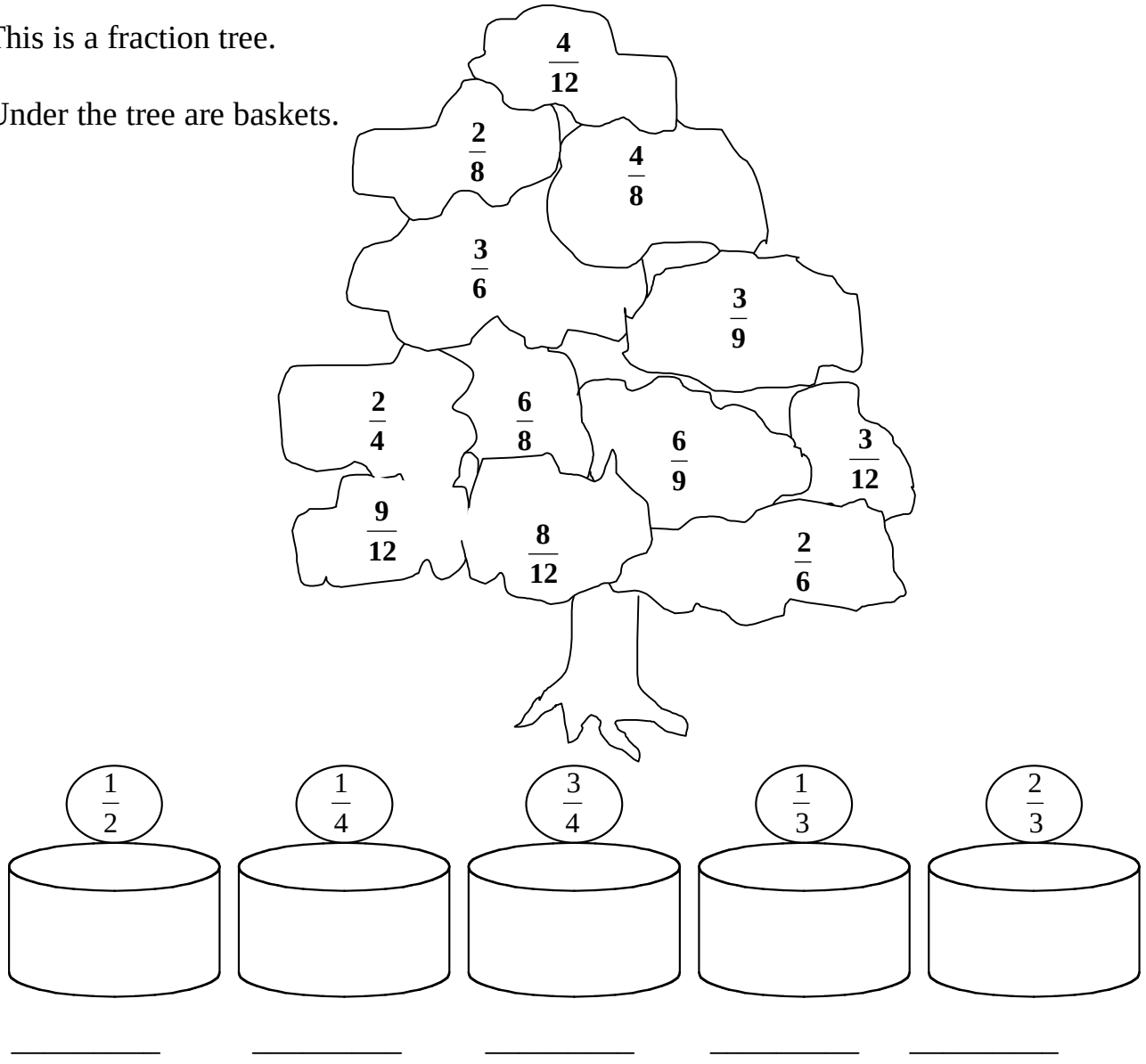
Task 4: Dinosaurs and Dragons	Rubric	
The core elements of performance required by this task are: • draw graphs and interpret data Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Marks the column with 9 letters that records 4 instead of 3 words	1	1
2. Labels both axes correctly Produces a correct bar graph *Partial credit* A graph with one error A graph with two errors.	1 3 (2) (1)	4
3. Statements such as: a) Both of the graphs should show the lengths of 20 words Both of the graphs have one word with 7 letters Both of the graphs have three words with 6 letters b) Adam's graph shows no words with 1 or 2 letters but Jade's graph has 4 of these. Adam's graph has 9 words with 8 or more letters but Jade's has none.	 1 1 1	3
Total Points		**8**

Picking Fractions

This problem gives you the chance to:
- work with equivalent fractions

This is a fraction tree.

Under the tree are baskets.



1. Equivalent fractions picked from the tree must be placed in the same basket.
   Put each fraction on the tree into the correct basket.

2. Find one **new** equivalent fraction for each basket and write it on the line that is in front of the basket.

3. Fill in the missing numerator and denominator to make this pair of fractions equivalent.

$$\frac{2}{} = \frac{\quad}{10}$$

Explain how you figured it out.

Task 5: Picking Fractions	Rubric	
The core elements of performance required by this task are: • work with equivalent fractions Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Puts the fractions into the correct baskets 1/2 = 4/8, 3/6, and 2/4 1/4 = 2/8 and 3/12 3/4 = 6/8 and 9/12 1/3 = 3/9, 2/6 and 4/12 2/3 = 6/9 and 8/12 All correct 5 points *Partial credit* 9, 10, 11 fractions correct 4 points: 8, 7 fractions correct 3 points: 6, 5 fractions correct 2 points: 4, 3 fractions correct 1 point	5 (4) (3) (2) (1)	5
2. Puts one more correct equivalent fraction onto each plate All 5 correct *Partial credit* 2-3-4 correct	2 (1)	2
3. Fills in the missing values such as: denominator 5 and numerator 4 or denominator 4 and numerator 5 or denominator 2 and numerator 10 or denominator 1 and numerator 2- or denominator 20 and numerator 1 and Gives correct explanation such as: They are equivalent fractions.	1	1
Total Points		**8**

Core Idea	Task	Score
Number Operations	**Votes**	
The task asks students to find and compare the total number of votes for two candidates and then to use multiplication to find a weighted value for their votes.		
Algebra	**Roger's Rabbits**	
The task asks students to identify and extend patterns and use a table. Successful students could also give rules for extending both elements in the pattern, the number of doors and the number of blocks needed to make a row of rabbit hutches.		
Number Operations	**Winning Lines**	
The task asks students to work with a "magic square" type number game to identify numbers that add to a given total or to generate a series of number sets that add to a given total. Successful students could reason about why some numbers were not possible to use to make a given sum and meet the rules of the game.		
Geometry	**Quilt Making**	
The task asks students to work with 2-dimensional shapes and their properties, such as symmetry and angles. Successful students knew the names for rhombus, parallelogram, and right triangle.		
Number Properties	**Sum Bugs**	
The task asks students to solve problems using multiplication and division. Successful students could generate numbers to fit 3 or more constraints, such as even number divisible by 5 and 3 with 3 digits.		

Votes

This problem gives you the chance to:
• work with a weighted point system

Some students vote for class president.

Each student can vote for a first choice and a second choice.

Amos, Brie and Carl received more votes than the other students.

	Amos	Brie	Carl
Number of 'first choice' votes	8	6	9
Number of 'second choice' votes	12	15	7

1. Who got the most votes, Amos, Brie or Carl? _____

2. Who got the most 'first choice' votes? _____

3. A 'first choice' vote gets 2 points and a 'second choice' vote gets 1 point.

   Explain why Carl gets 25 points altogether. _____

_____

_____

4. Figure out the points for:

a. Amos _____

b. Brie _____

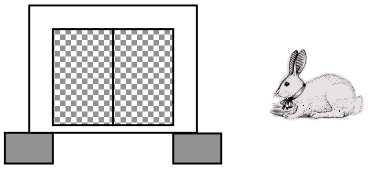
5. Who should be class president? _____

Votes		**Rubric**
The core elements of performance required by this task are: • work with a weighted point system Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **Brie**	1	1
2. Gives correct answer: **Carl**	1	1
3. Gives correct explanation such as: Carl gets 2 x 9 + 7 = 25votes	2	2
4.a. Gives correct answer: **28** b. Gives correct answer: **27**	1 1	2
5. Gives correct answer: **Amos**	1ft	1
Total Points		**7**

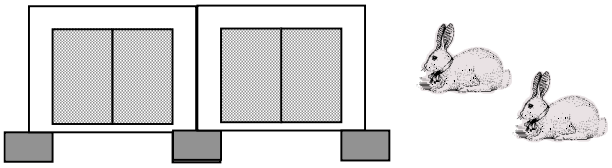
Roger's Rabbits

This problem gives you the chance to:
- identify and extend patterns
- work with tables

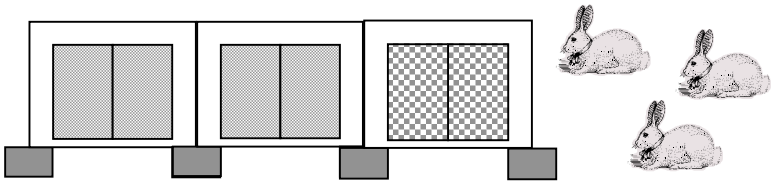
Roger keeps pet rabbits. He keeps them in a row of rabbit hutches.
The hutches are on blocks so that they don't get damp.



This is hutch #1.
It is for one rabbit.
It has 2 doors and 2 blocks.



This is hutch #2.
It is for two rabbits.
It has 4 doors and 3 blocks.



This is hutch #3.
It is for three rabbits.
It has 6 doors and 4 blocks.

1. Describe hutch #4.

_____

_____

2. Fill in the empty spaces in the table below.

Hutch #	1	2	3	4
Number of doors	2	4		
Number of blocks	2	3		

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3. How many doors will be needed for hutch # 8? _____
   Explain how you figured this out.

   _____

   _____

   How many blocks will be needed for hutch #8? _____

4. Roger says that for hutch # 12 he will need 11 blocks. Roger is wrong.
   How many blocks will he need? _____

   Explain how you figured this out.

   _____

   _____

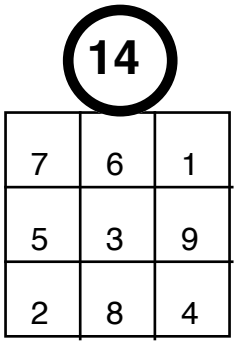
Roger's Rabbits — Rubric

The core elements of performance required by this task are: • identify and extend patterns • work with tables Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives a correct description: 4 rabbits, **8** doors and **5** blocks.	2 x 1	2
2. Completes the table correctly. Hutch # | 1 | 2 | 3 | 4 Number of doors | 2 | 4 | **6** | **8** Number of blocks | 2 | 3 | **4** | **5** *Partial credit* 2 correct numbers	2 (1)	2
3. Gives correct answer: **16** doors Gives correct explanation such as: the number of doors is twice the hutch number or draws diagram. Gives correct answer: **9**	1 1 1	3
4. Gives correct answer **13** blocks. Gives correct explanation such as: He will need two blocks for hutch number 1 and then one block for each of the next blocks.	1 1	2
Total Points		**9**

Winning Lines

This problem gives you the chance to:
- work with a 'magic square' type number game

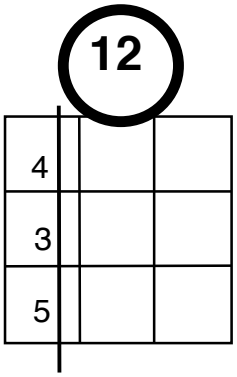
Gina and Sam are playing a card game.
They place number cards on a large game board.
A **target number** is written inside a circle at the top of each board.



To win a point they need to make a line of three numbers whose sum is the target number.
The three numbers can be written in a column, a row or a diagonal.

In any game the same number cannot be used more than twice.
No zeros are allowed.

1. Gina and Sam have completed the game shown above. The target number is 14.
   Draw lines through the five winning lines.

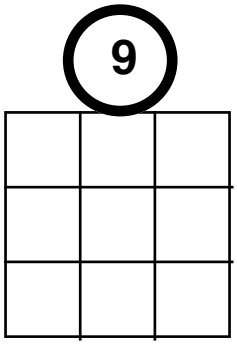


2. Here is a game board that has already been started.

   One point has been won because 4 + 3 + 5 = 12.

   Write numbers on the empty cards to win at least three more points.

   Draw lines through your winning lines.

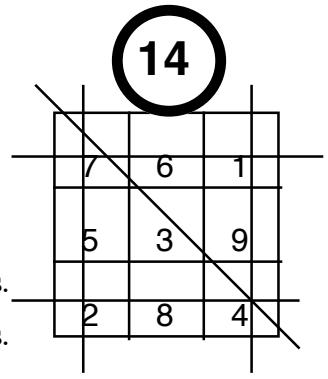


3. Here is a new game board.

   Fill in the numbers to win at least four points

   Draw in the winning lines.

   Explain why the number 8 cannot be used in any winning line.

Winning Lines	Rubric	
The core elements of performance required by this task are: • work with a 'magic square' type number game Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Draws a line on all 5 winning lines with no extras.  *Partial credit.* Draws a line on 4 or 3 winning lines with no extras. Draws a line on 2 or 1 winning lines with no extras.	3 *(2)* *(1)*	3
2. Creates at least 3 more winning lines and draws in the lines to indicate where they are. *Partial credit.* Creates 2 or 1 winning lines and draws lines to indicate where they are. **or** Creates 3 correct winning lines and 1 error.	2 *(1)* *(1)*	2
3. Fills in the digits to win at least 4 points. Gives correct explanation such as: If the number 8 was used it would mean that only 1 could be used only once to reach the target number and it needs to have 3 digits to be a winning line.	1 1	2
Total Points		**7**

Note: Where student uses a digit more than twice or uses the digit "0" treat as a misread and subtract one point from the total.

Quilt Making

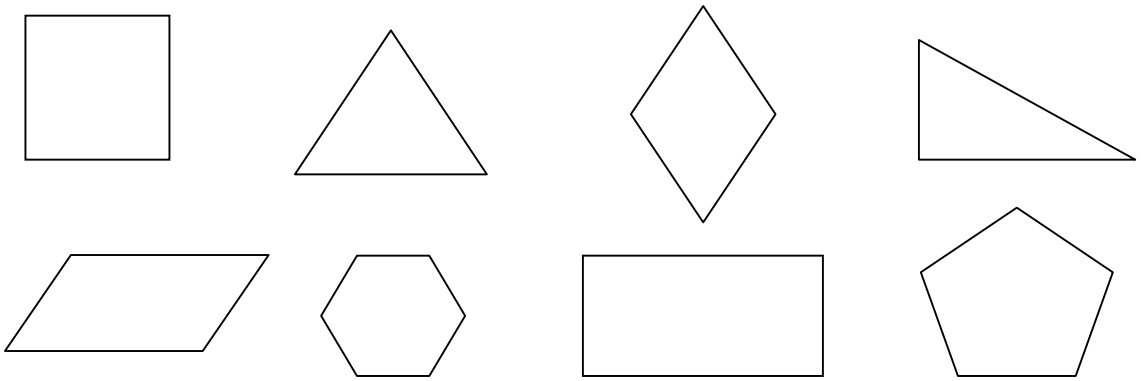
This problem gives you the chance to:

- work with 2D shapes and their properties

Matthew and his grandma make patchwork quilts.

Matthew helps his grandma sort the shapes.

1. Today his grandma wants shapes that have at least one right angle for her quilts.
   Draw a ring around the shapes with at least one right angle.



2. The next quilt just needs shapes that have at least one line of symmetry.

   Put a check mark (√) inside the shapes that have at least one line of symmetry.

   Name two shapes that **do not** have lines of symmetry.

   _____ _____

   Name three **quadrilaterals** that have lines of symmetry.

   _____ _____

   _____

3. Sometimes Matthew's grandma chooses to make a quilt using just one shape.
   She can only do this using shapes that fit together.
   Name one of the shapes shown above that will **not** fit together?

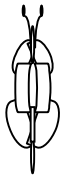
   _____

Quilt Making	Rubric	
The core elements of performance required by this task are: • work with 2D shapes and their properties Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Draws a ring around: **square, right triangle, rectangle.** All correct with no extras. *Partial credit* Two correct with no more than one extra.	2 *(1)*	2
2. Puts a check mark inside the shapes: **square, equilateral triangle, rhombus, hexagon, rectangle and pentagon.** All 6 correct with no extras. For each extra deduct one point. *Partial credit* 5-4 correct with no extras. Gives correct answers: **Parallelogram, right triangle** (accept scalene) **Square, rectangle, rhombus** All 5 correct 3 points *Partial credit* 4 correct 3 or 2 correct	2 (1) 3 (2) (1)	5
3. Gives correct answer: **pentagon**.	1	1
Total Points		**8**

Sum Bugs

This problem gives you the chance to:
• solve problems using multiplication and division

1. Evenbugs can only eat numbers that can be divided by two.
   Draw a ring around the numbers that this bug can eat.



   7 12 20 49 56 65 100 259

   Can this bug eat number 348? _____
   Explain how you figured this out.

   _____

2. Tribugs can only eat numbers that can be divided by three.
   Draw a ring around the numbers that this bug can eat.

   6 8 9 13 23 24 60 92 333

   Can this bug eat the number 351? _____
   Show how you figured this out.

3. Unibugs can only eat one number.
   The number is odd, more than 10, divisible by 3 and less than 20.
   Write down the one number they can eat. _____
   Show how you figured this out.

4. Ninobugs can only eat numbers that are divisible by the number nine.
   Draw a ring around one of these numbers they can eat.

   22 112 205 324 764

   Show how you figured this out.

5. Sumobugs can only eat numbers that are even, divisible by both 5 and 3, and have three digits.
   Write down one number they can eat. _____
   Show your work.

Sum Bugs	Rubric	
The core elements of performance required by this task are: • solve problems using multiplication and division Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Draws a ring around #s **12, 20, 56, 100** and no others. Yes **and** shows that 348 ÷ 2 = 174 or states that the last digit is even and therefore the number is even.	1 1	2
2. Draws a ring around the #s **6, 9, 24, 60, 333** and no others. Yes **and** shows 351 = 3 x 117 **or** states that the digit sum is divisible by 9.	1 1	2
3. Gives correct answer: **15** Shows work such as: 11, 12, 13, 14, 15, 16, 17, 18, 19 are # between 10 and 20 12, 15, 18 are divisible by 3 Only 15 is odd. **or** Only 11, 13, 15, 17 19 are odd Only 15 is divisible by 3	1 1 **or** 1	2
4. Gives correct answer: **324** and no others. Gives a correct explanations such as: 324 = 9 x 36	1 1	2
5. Gives one correct answer such as: 120, 300 **and** shows some correct work	1	1
Total Points		**9**

Balanced Assessment Test –Fourth Grade 2009

Core Idea	Task
Number Operations	**Dragonflies**
The task asks students to reason about equal size groups for multiplication and division in the context of dragonfly parts, such as number of wings. Successful students could find the quantity of parts given the number of dragonflies using repeated addition or multiplication. They could also find the number of dragonflies given the total number of parts using repeated addition or subtraction.	
Geometry	**Fair Play**
The task asks students to find area and perimeter of a rectangle. In third grade students regularly find area by counting the number of square units in a rectangle. In fourth, grade students should start to use multiplication of length times width to find the area. Successful students could find the perimeter of a rectangle, divide the area of a rectangle into half, and find the perimeter of half the rectangle.	
Number Operations/ Patterns	**Mayan Numbers**
The task asks students to look at a visual pattern and extend the pattern by drawing. Then students are asked to interpret the symbols and use them to solve simple number problems. Successful students could decode and extend part of the pattern and use the symbols to accurately do calculations involving addition and subtraction.	
Number Properties	**Leapfrog Fractions**
The task asks students to work with the concept of adding familiar fractions to make a total of one-whole. At this grade level, students should be able to reason about equivalent fractions and use models to help them reason about one-whole. Many students at this grade level know that $1/2 + 1/4 + 1/4 = 1$. Successful students could also think about thirds, ninths and eighths.	
Data	**Texting**
This task asks students to read and to interpret line plots and construct a line plot from a frequency (tally) chart. Successful students could make a line plot and identify similarities and differences in the data of two line plots.	

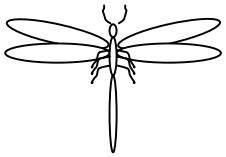
Grade Four

Dragonflies

This problem gives you the chance to:
• use multiplication and division in a real-life situation

Grade 4 students are visiting an insect farm.
They have learned that a dragonfly has:

6 legs, 4 wings, 2 antennae and 3 bodyparts.



The students are watching different groups of dragonflies.

1. In a group of 5 dragonflies, how many wings are there? _____
   Show how you figured this out.

2. The students count 28 antennae, how many dragonflies are there? _____
   Show how you figured this out.

3. Lisa counts 10 heads, how many bodyparts can she see? _____

4. Sam says he can see 22 legs on a group of dragonflies.
   Explain how you know that he has not counted correctly.

_____

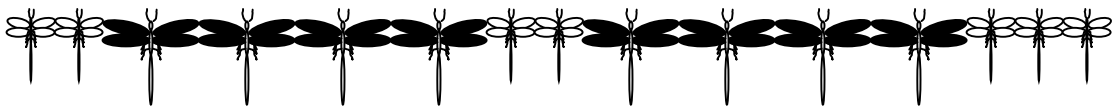
_____

4 inches

5. The span of the wings of an Emperor dragonfly is 4 inches.

   A Darter Dragonfly's wing span is 2 inches.

   Cody draws a pattern of 8 Emperor dragonflies and 7 Darter dragonflies in a line.



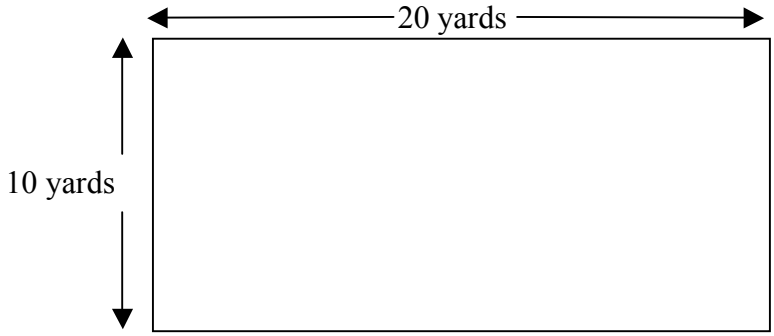
How long is the line of dragonflies? _____ inches
Show how you figured this out.

Dragonflies	Rubric	
The core elements of performance required by this task are: • relate fractions, decimals and percents Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answers: **20** Shows work such as: 5 x 4 = 20	1 1	2
2. Gives correct answer: **14** Shows work such as: 28 divided by 2 = 14	1 1	2
3. Gives correct answer: **30**	1	1
4. Gives correct explanation such as: 22 is not divisible by 6.	1	1
5. Gives correct answer:**46** Shows work such as: 8 x 4=32 accept repeated addition. 7 x 2=14 32 + 14 = 46 *Partial credit* One error	1 2 (1)	3
Total Points		**9**

Fair Play

This problem gives you the chance to:
- find areas and perimeters of rectangles

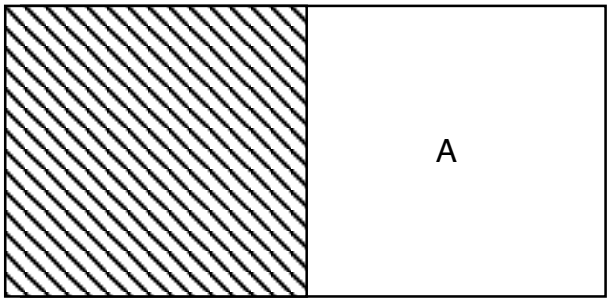
The Grade 4 students have a play area.
These are its measurements.

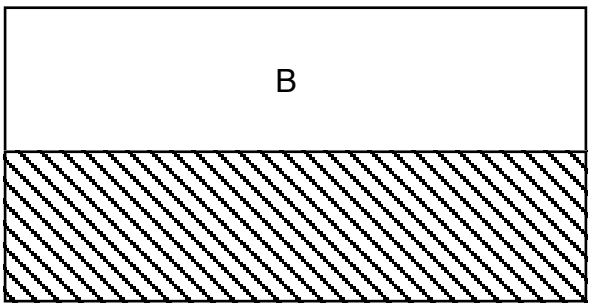


1. What is the area of the play area? _____ square yards
   Show how you figured this out

2. The students would like a fence to be put around the area to stop balls going too far.
   What will the total length of the fence be?
   Show how you figured this out. _____ yards

3. The girls say that the boys take up too much space with their ball games.
   They want the area to be split into two equal parts.
   Here are two possible ways of dividing the area.



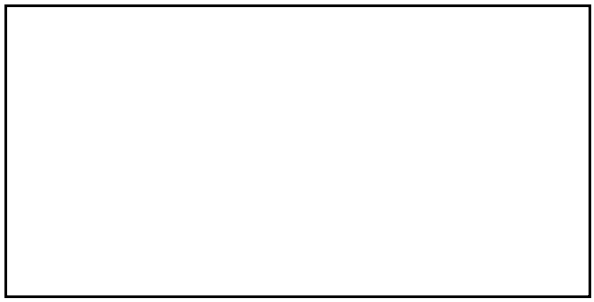


What are the perimeters of these areas?

A = _____yards

B = _____yards

4. Draw a straight line that divides the play area into two equal parts in a **different** way.



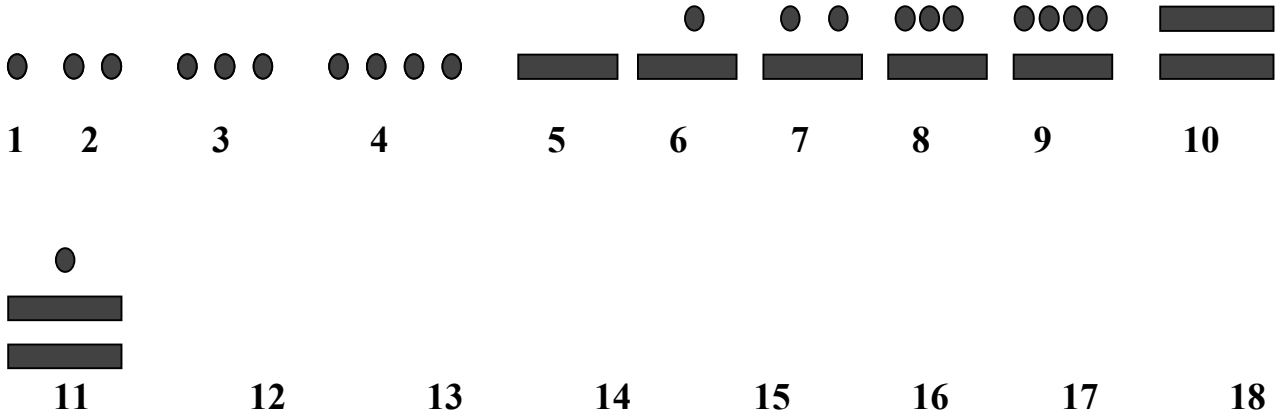
Fair Play	Rubric	
The core elements of performance required by this task are: • to find areas and perimeters of rectangles. Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answer: **200** square yards Shows work such as: 20 x 10 =200	1 1	2
2. Gives correct answer: **60** yards Shows work such as: 10 +20 + 20 +10 = 60	1 1	2
3. Gives correct answer: A = **40** yards Gives correct answer: B = **50** yards	1 1	2
4. Makes an area such as: a right triangle.	1	1
Total Points		**7**

Mayan Numbers

This problem gives you the chance to:
- use symbolic notation

The Maya were an ancient people who lived in Central America.
They were very clever at math.

This was the start of their number system.



1. Continue writing the Mayan numbers up to number 18.

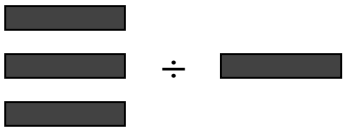
Adding and subtracting in Mayan numbers is easy. Here is a sum done for you.

Here are some Mayan calculations for you to do.
Write the correct answers in **Mayan symbols**.

2. 

3. 

4.  =

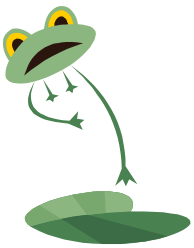
5.  =

6. 

Mayan Numbers	Rubric	
The core elements of performance required by this task are: • use symbolic notation Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answers: 2 lines and two spots for 12 2 lines and three spots for 13 2 lines and four spots for 14 3 lines for 15 3 lines and one spot for 16 3 lines and two spots for 17 3 lines and three spots for 18 *Partial credit* 1 or 2 errors 3 or 4 errors 5 errors	4 (3) (2) (1)	4
2. Gives correct answer: 2 lines for 10	1	1
3 Gives correct answer: 3 spots for 3	1	1
4. Gives correct answer: 1 line and 4 spots for 9	1	1
5 Gives correct answer: 3 spots for 3	1	1
6. Gives correct answer: 2 lines and 1 spot for 11 *Note* Questions #2 – 6 Gives a correct number only, score as a misread.	1	1
Total Points		**9**

Leapfrog Fractions

This problem gives you the chance to:
• use fractions to solve problems

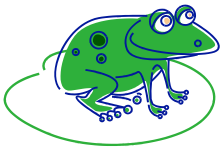


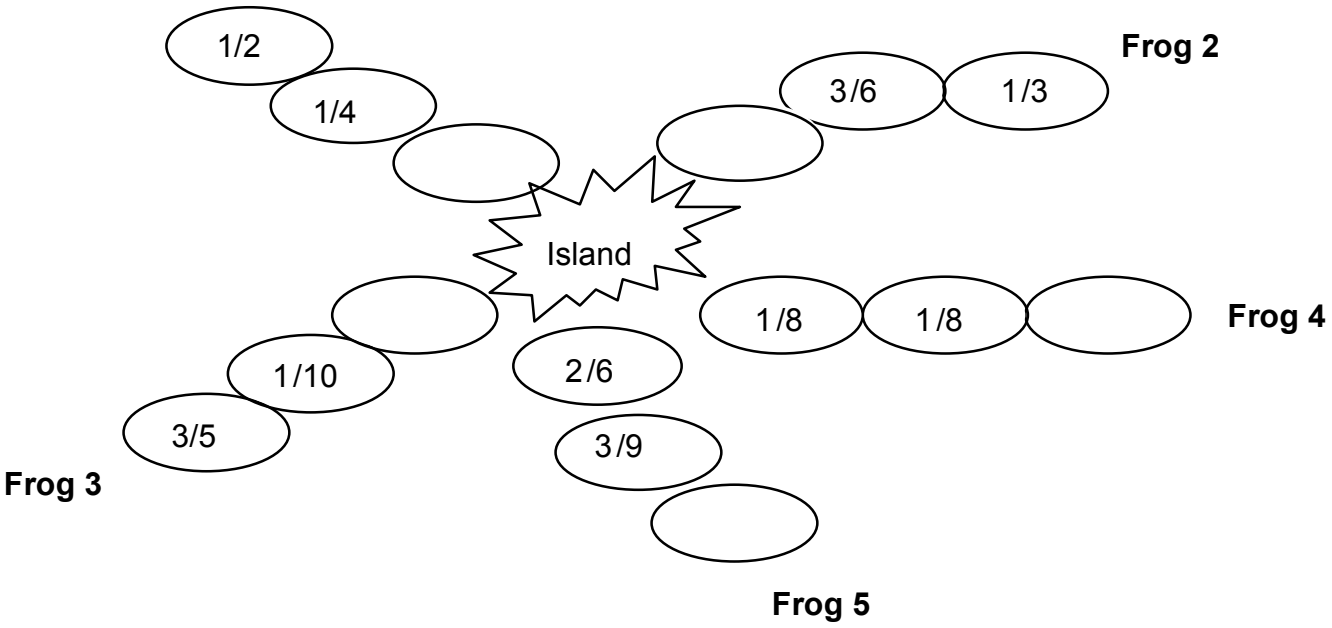
These leaping frogs are playing a fraction game.
They leap from lily pad to lily pad adding up the fractions as they go.

They have just three lily pads each.

When they have counted up to one whole, and no more,
they can reach the island in the center of the lake.

1. Complete the lily pad fractions so that these five frogs can get to the island.
   Write your answers on the empty lily pads.





2. Frog number 6 wants to join his friends on the island.
   His three lily pads are:

$$1/4 + 1/5 + 10/20$$

   Can he make it? _____
   Show how you figured this out.

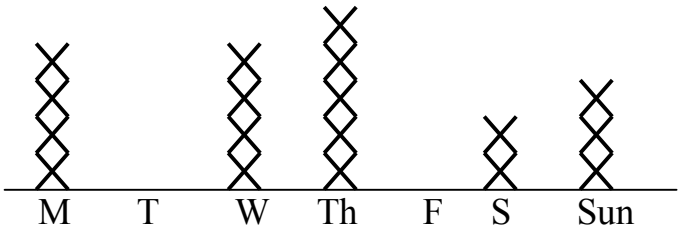
Leapfrog Fractions	Rubric	
The core elements of performance required by this task are: • use fractions to solve problems Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Gives correct answers: accept equivalent fractions Frog 1**: 1/4** Frog 2**: 1/6** Frog 3**: 3/10** Frog 4**: 3/4** Frog 5**: 1/3**	5 x 1	5
2. Gives correct answer: **No** **and** shows work such as**:** 1/4 = 5/20 1/5 = 4/20 5 + 4 + 10 = 19 So Frog #6 is 1/20 short Accept diagrams **Partial credit** ***Attempts to compare fractions***	2 (1)	2
Total Points		**7**

Texting

This problem gives you the chance to:
• use line plots to compare two sets of data

Nicola thinks she receives more text messages than she sends.

To check this out she made a line plot showing the messages she **sent** each day this week.

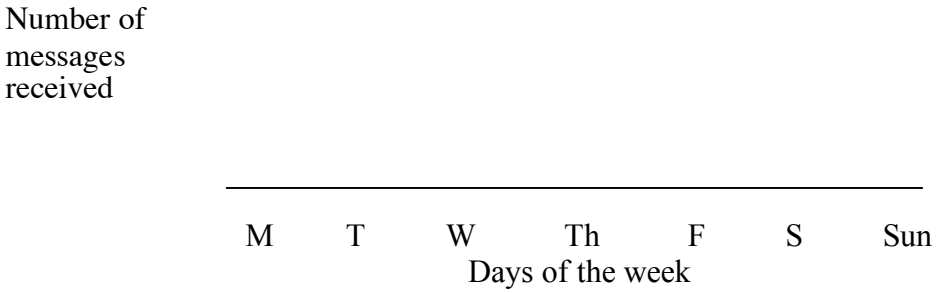


She tallied the messages she **received**.

M |||| T | W ||| Th

F S |||| Sun ||||

1. Make a line plot to show this information.



Look at the data in the two line plots.

2. Did Nicola receive more texts than she sent? _____
   Explain how you know.

_____

3. Write two things that are the same in both line plots.

_____

_____

_____

_____

4. Compare one thing that is different in the line plots.

_____

Texting		Rubric
The core elements of performance required by this task are: • use line plots to compare two sets of data Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
1. Draws a correct line plot. *Partial credit* One error 2 points Two errors 1 point	3 (2) (1)	3
2. Gives correct answer: No **and** She sent the same number of texts as she received. 18 texts	2	2
3. Writes two things that are the same in the bar graphs, such as: Both have 2 days with no messages. Both have the same number of texts on Monday.	2f.t. x 1	2
4. Writes one thing that is different, such as: Nicola sends fewer texts at the weekend than she receives.	1f.t.	1
Total Points		**8**