Kinder Inquiring Minds Want To Know

Grade Level: Kindergarten

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Length of Unit: Five inquiry lessons selected from the kindergarten science year

I. ABSTRACT

A. What is the Inquiry Scientific Process? We will give many examples of how to introduce and implement Core Knowledge science concepts through using age appropriate observation, measurement, hands-on experimentation, communication, and mental processes in a scientific manner. We integrate science, math, literacy, and assessments for each lesson!

II. OVERVIEW

A. Concept Objectives

1. Students will discover basic science concepts through use of the inquiry process as they explore and experiment.

B. Content from the *Core Knowledge Sequence*

1. Taking care of your body: exercise, cleanliness, healthy food, rest.
2. Animals and Their Needs: Animals, like plants, need food, water, and space to live and grow.
3. The Human Body: The five senses and associated body parts.
4. Introduction to Magnetism: classify materials according to whether they are or are not attracted by a magnet.
5. Plants and Plant Growth: What plants need to grow; sufficient warmth, light, and water.

C. Skill Objectives

1. The student is expected to ask questions about organisms, objects, and events.
2. The student is expected to plan and conduct simple descriptive investigations.
3. The student is expected to gather information using simple equipment and tools to extend the senses.
4. The student is expected to construct reasonable explanations using information.
5. The student is expected to communicate findings about simple investigations.
6. The student is expected to make decisions using information.
7. The student is expected to discuss and justify the merits of decisions.
8. The student is expected to explain a problem in his/her own words and propose a solution.
9. The student is expected to identify and use senses as tools of observation.
10. The student is expected to make observations using tools including hand lenses, balances, cups, bowls, and computers.

III. Background Knowledge

A. For Teachers

1. *Core Knowledge K-8 Sequence*. Charlottesville, Va. 1-890517-20-8.
2. Hirsch, Jr. E.D. *What Your Kindergartener Needs to Know*. New York, New York: Dell Publishing, 1996. 0-385-31841-3

B. For Students: None as students are at the first year of their formal school lives-possible introduction to staying healthy through home lessons and preschool units.

IV. Resources

A. Berger, Melvin. *Germs Make Me Sick.* New York, New York: Harper Collins,

1995, 0-064-45154-2.

B. Freeman, Marcia S. *"You Are A Scientist".* Vero Beach, Fl: Rourke Publishing, 2004. 1-595-15126-5.

C. *Webster's Dictionary Plus Thesaurus.* USA: Nickel Press, 1993. 1-879424-42-8.

V. LESSONS

Lesson One: The Human Body-Taking Care of Ourselves (Time-Five days to allow germs to grow.)

A. *Daily Objectives*

1. Concept Objective
   a. Students will discover basic science concepts through use of the inquiry process as they explore and experiment.
2. Lesson Content
   a. Taking care of your body: exercise, cleanliness, healthy food, rest
1. Skill Objectives
   a. The student is expected to ask questions about organisms, objects, and events.
   b. The student is expected to plan and conduct simple descriptive investigations.
   c. The student is expected to gather information using simple equipment and tools to extend the senses.
   d. The student is expected to construct reasonable explanations using the information.

B. *Materials*

1. Two potatoes
2. Four zip-loc baggies
3. Science chart
4. Sentence strips
5. Inquiry Process Chart
6. Chart paper

C. *Key Vocabulary*

1. Healthy-good condition of the body
2. Germs-small cell from which an organism may develop
3. Scientist-a person who studies a problem or question-a researcher

D. *Procedures/Activities*

1. Introduce the lesson on cleanliness by asking kinders how we can stay healthy; referring to the KWL chart began at the beginning of this five-day unit. Students respond with various answers including washing hands and bodies.
2. Read*: Germs Make Me Sick*
3. Record students reflections on what they want to know and have learned about germs on the KWL chart after the read-aloud
4. Ask the students, "Do you think we have germs in our class?" Record responses on Science Chart and discuss.
5. Read: *What is a Scientist?*
6. Discuss about how we can be scientists in our class using our senses to discover if we have germs in our room.

7. Show the whole potatoes to the students and ask how we can use them to discover if we have germs. Record answers on chart paper.
8. Ask students where they think germs may be present in the classroom and record their predictions. Record all reasonable answers.
9. Have students choose four places from their list to investigate.
10. Students work in small groups to rub slices of potatoes in each part of the kinder classroom chosen
11. Potato slices are placed in a zip-loc baggie and labeled with location
12. Potato slices are observed in science/discovery center for six days to determine germ growth. Students will journal daily about their observations.
13. On fifth day, students discuss results with teacher. Question of the day is, "What do we need to do to prevent germs in our class?" Students will usually respond that the teacher needs to clean those areas daily.
14. Teacher wonders aloud if class material managers can add that job to their daily chores. All agree!!

A. *Assessment/Evaluation*: Students are assessed based on their prior knowledge of how to stay healthy by telling the class what they already know.

B. Teacher records answers on the "K" portion of a K-W-L chart. Many opportunities for assessment include recorded results on inquiry chart about the germ experiment itself and by teacher making anecdotal records on understanding.

Lesson Two: Magnets and How They Work

A. Daily Objectives
   1. Concept Objective
      a. Students will discover basic science concepts through use of the inquiry process as they explore and experiment.
   2. Lesson Content
      a. Classify objects according to whether or not they are attracted to a magnet.
      b. Identify items and substances that may strengthen or weaken the attraction of the objects to the magnet.
   3. Skill Objective(s)
      a. The student is expected to identify objects that will be attracted to a magnet.
      b. The student is expected to brainstorm items and substances that will strengthen or weaken the attraction of the objects to a magnet.
      c. The student is expected to use magnets and objects in order to conduct experiments and collect data.
      d. The student is expected to make predictions of the outcome of the experiments.
      e. The student is expected to record data.

B. *Materials*
   1. Enough Magnets for small groups to share. The magnets should all be the same size and shape in order to provide consistency is the experiments.
   2. Objects the students brainstorm will be attracted to a magnet. Prove a variety. This may include paper clips, coins, screws, bolts, magnetic balls, etc…
   3. Items and substances the students brainstorm will strengthen or weaken the attraction of the objects to the magnet. This might include water, sand, cloth, paper etc….

4. Containers to hold substances.
5. Science Inquiry Map
6. Chart Paper
7. Appendix A

C. *Key Vocabulary*
1. Magnets-body attracting other magnetic material
2. Attract-drawn to

D. *Procedures/Activities*
1. Introduce the lesson by reviewing KWL chart began at the beginning of this five-day unit. Students reflect on what they already know about magnets and how they work.
2. Review book: *What Magnets Can Do* with class. This was read at the beginning of this five-day unit.
3. Ask the students, "What do you think will happen if we place items that are attracted to magnets in or under something?" " Will the magnet still attract the object?" "What makes you think that?"
4. Students brainstorm items that will strengthen or weaken an objects attraction to a magnet. Teacher writes the ideas on chart paper.
5. Teacher records question, "Will the Magnet still work?", on the Science Inquiry Map.
6. Students make predictions and teacher records them on the Science Inquiry Map.
7. Discuss how we can be scientists in our class by conducting experiments in order to collect data and find answers to our questions.
8. Students work in small groups using magnets, objects that are attracted to magnets, and items/substances from the list the students brainstormed. Each group will be provided with containers of water, paper, and one item or substance they choose from the list.
9. Students will use appendix A in order to record their findings.
10. Each group will report their findings to the class.
11. Teacher will record results on the Science Inquiry Map.
12. Class will discuss why they think the magnet did or didn't work.
13. Teacher will record what we learned on the Science Inquiry Map.

E. *Assessment/Evaluation*
1. Students will be assessed based on Appendix A

Lesson Three: The Five Senses

Daily Objectives
1. Concept Objective(s)
   a. Students will discover basic science concepts through use of the inquiry process as they explore and experiment.
2. Lesson Content
   a. The Five Senses and associated body parts.
   b. Students use ears for their sense of Hearing.
   c. Students describe order of events or objects.
3. Skill Objective(s)
   a. The student is expected to construct reasonable explanations using information.
   b. The student is expected to gather information using simple equipment and tools to extend the senses.

c. The student is expected to communicate findings about simple investigations.
d. The student is expected to identify the ordinal positions in a sequence.
e. The student is expected to recognize and write numbers.

F. *Materials*

1. A magic drape (tablecloth, butcher paper, and/or curtain).
2. Chart paper
3. Huge face cut from butcher paper for mural
4. Markers
5. 4 or 5 boxes
6. Pencil sharpener
7. Scissors
8. Book
9. Stapler
10. Whistle
11. Hole puncher
12. Tape dispenser
13. Bandana
14. Tape player
15. Class Magic Noise Sequence Sheets Appendix B
16. Group Magic Noise Sequence Sheets Appendix C
17. Five Senses Journals Appendix D

G. *Key Vocabulary*

1. Ears-the part of the body that allows us to hear sounds around us.
2. Sound-vibrations in the air the produce noise.

H. *Procedures/Activities*

1. Play the Listening game: One student wearing a bandana over his eyes sits with his or her back to the other students. The teacher taps a student who will say "Hi! (Student's name)" The student with his or her back to the class tries to guess who said Hi. Continue doing this game picking different students for about 5 minutes.
2. After playing this game, discuss questions like these with the students: How were you able to tell who said your name? What did you have to do to guess the person? Why do you think you were able to guess the person at all? How would you guess a person from a different class? How did you listen? What did you use to determine who was speaking? This leads to talking about listening and using ears for hearing and learning about their environment.
3. Have the students share the pen and write, "I can hear with my ears" for the face mural. This will be glued onto the face next to the ears. Each day a sentence will be written based on the sense of the day.
4. Then as a group, guide the students into a discussion about sounds they hear at home or around them. Record these items on chart paper and circle items that can be played and tested for the class game called "Magic Noise Sequence." (Choose the items that are on your recording sheet)
5. Now the teacher will find a magic spot in the classroom with a magic drape to hide the items as they are played. Now play the chosen items behind the drape or even play a tape with these noises previously recorded. The students will record the sounds by writing numbers under the pictures in the order they hear the sounds on the *Class Magic Noise Sequence Sheet Appendix B* .

6. Go over the order and celebrate the kids using their sense of listening to gain knowledge about their environment. Discuss the same questions about how did they know, why did they know, and what made them know like listening game.
7. Now have the students brainstorm sounds they hear in the classroom like pencil sharpener and/or tape player. From this list, pick out items that you have made on your *Group Magic Noise Sequence Sheet Appendix C* for the partner magic noise game.
8. Divide the class into groups of 4. Each group will have a box full of sound items found in the classroom that were brainstormed. One person at a time picks out an item and makes the sound under or behind a magic drape. All the group members guess the item and write a number under the picture in the order they heard it. The group members keep taking turns until all items have been heard, guessed, and recorded.
9. After all groups have completed the partner magic noise page, meet back together as a class and discuss the importance of hearing and how we use hearing in every day life. Also touch on if there were any circumstances that made it hard to determine or guess what was being played in the games. Also discuss how hearing helps us daily, keeps us safe, and help us learn about our world.

I. *Assessment/Evaluation*
1. The students will write in their *Five Senses Journal Appendix D*.
2. The students will be monitored as they complete the Class and Group Magic Noise Sequence sheets.

Lesson Four: Science Inquiry Project Insects!

J. *Daily Objectives*
1. Concept Objective(s)
   a. Students will discover basic science concepts through the use of the inquiry process through discovery research.
   b. Students connect observations and data from multiple questions.
   c. Students will make comparisons and state conclusions.
   d. Students will develop vocabulary and the ability to communicate observations and ideas.
2. Lesson Content
   a. The students learn that living organisms have basic needs.
3. Skill Objective(s)
   a. The student is expected to identify basic needs of organisms.
   b. The student is expected to ask questions about animals and their needs.
   c. The student is expected to plan and conduct simple descriptive investigations of basic needs of insects.
   d. The student is expected to gather information using simple equipment and tools to extend the senses.
   e. The student is expected to gather information of the characteristics of animals.
   f. The student is expected to construct reasonable explanations using data obtained.
   g. The student will explore the interdependence of organisms and discuss the common characteristics and needs of animals.

K. *Materials*
1. Library books on various insects

2. Videos of different insects
3. Chart paper
4. *What Your Kindergartner Needs to Know, p. 263*
5. Individual insect voting cards Appendix E, one per child
6. Student generated inquiry questions recording sheets Appendices F-I
7. Classroom set of manila paper.

L. *Key Vocabulary*

1. Insect- A small creature with three pairs of legs, one or two pairs of wings and three main body parts.
2. Needs- Things that animals must have to live
3. Inquiry- A study or an investigation.
4. Research- To study or find out about a subject.

M. *Procedures/Activities*

1. Prior to the lesson, expose students to various insects through videos and library books.
2. Brainstorm a list of insects the students would like to research for knowledge and understanding.
3. Have students vote on an insect. See example, Appendix E.
4. Introduce the lesson by generating questions for the inquiry study (such as, what do baby _____ look like? What do they eat? How many body parts? How do they communicate? How do they help us?
5. Students will create questions about specific insect.
6. Teacher will record generated questions on chart tablet.
7. Teacher creates recording sheets for class and divides the students into groups (each group will research one question and report to the others.) See example, Appendices F-I.
8. Students will visit the library to investigate and pursue the question.
9. As students work in groups they will describe and record their answers. Students will demonstrate observations by making simple drawing on insect recording sheets.
10. Gather the students back into a large group to analyze and draw conclusions based on data collected on recording sheets.
11. Teacher helps students compare and contrast research findings.
12. Students will demonstrate knowledge and understanding of inquiry by drawing and writing about their observations on manila paper.

N. *Assessment/Evaluation*

1. The teacher will closely monitor individual student participation in collecting and recording data. Each student will demonstrate knowledge obtained by drawing and writing on manila paper.
2. Students will demonstrate understanding on group insect recording sheets. Teacher will combine observation sheets into a class book.

Lesson: Plants- Parts of a Plant

A. Daily Objectives

3. Concept Objective(s)
    a. Students will discover basic science concepts through use of the inquiry process as they explore and experiment.
    b. Students will discover that systems have parts and are composed of organisms and objects.
    c. Students will discover that many types of change occur.

4. Lesson Content
   a. Plants- knowing parts of a plant
5. Skill Objective(s)
   a. The student is expected to ask questions about organisms, objects, and events.
   b. The student is expected to describe properties of objects and characteristics of organisms.
   c. The student will sort organisms and objects into groups according to their parts and describe how the groups are formed.
   d. The student will record observations about parts of plants including leaves, roots, stems, and flowers.

O. *Materials*
1. One plant from home for every child
2. Markers/crayons/pencils
3. Construction paper
4. Chart paper
5. Hand lenses
6. Glue
7. Appendix J

P. *Key Vocabulary*
1. Roots- the part of the plant that usually goes down into the soil.
2. Stem- the main supporting part of a plan that usually grows above the ground.
3. Leaf-a usually thin, flat, green plant part attached to a stem or stalk.
4. Flower-the part of a plant that produces seeds, usually with colorful petals.

Q. *Procedures/Activities*
1. Introduce the lesson on parts of a plant by asking kinders what do we know about plants, which you would record onto a KWL chart. Students respond with various answers. This is in a large group.
2. Ask the kinders, " What do we want to know about plants" record onto the KWL chart. Discuss how we will find the answers to these questions, students will respond with various answers.
3. Let them know they are going to become the scientists by going to their tables and observing and recording information about their plant. This will be recorded on the Plant observation sheet. You should have hand lenses available for them.
4. Have students get into groups of 4 and ask them to see how the plants are alike/different. Have them share and compare. Have them look for things that are the same and different about each one of their plants.
5. Come back to a large group and have each group discuss and explain what they observed about the plants. Ask the students if we have answered any of the questions that we wanted to learn about, record if so.
6. Read; *Seed to Plant*
7. Discuss the book and add to the KWL chart.
8. Read; *How a Seed Grows*
9. Discuss the book and see if they compare it to previous knowledge such as the life cycle of a butterfly.
10. The students will then take their plant and glue in onto a piece of construction paper folded in half with four sections to label each part of the plant.

R. *Assessment/Evaluation*
1. Students are assessed by using their real plant and labeling each part correctly.

VI. CULMINATING ACTIVITY

We do not have a culminating activity due to this is an ongoing process through all our science lessons**.**

VII. HANDOUTS/WORKSHEETS

a. Appendix A- Will The Magnet Still Work?
b. Appendix B-Class Magic Noise Sequence
c. Appendix C-Group Magic Noise Sequence
d. Appendix D-Five Senses Listening Journal-*I can hear with my ears!*
e. Appendix E-Insect Voting Cards
f. Appendix F-How do bees communicate?
g. Appendix G-Where do bees live?
h. Appendix H-What is the lifecycle of the bee?
i. Appendix I-How do bees make honey?
j. Appendix J-Plant Observation

V11I. BIBLIOGRAPHY

A. Berger, M. *Germs Make Me Sick.* New York City, New York: Harper Collins, 1995. 0-064-45154-2.

B. *Core Knowledge K-8 Sequence.* New York City, New York: Dell Publishing, 1996. 1-890517-20-8.

C. Fowler, A. *What Magnets Can Do?* Chicago, Illinois: Children's Press, 1995. 0-516-06034-1.

D. Freeman, M. *"You Are A Scientist".* Vero Beach, Fl: Rourke Publishing, 2004. 1-595-15126-5.

E. Gibbons, G. *From Seed to Plant.* New York, New York: Holiday House, Inc, 1993. 0-823-41025-0.

F. Hirsch, Jr. E.D. *What Your Kindergartener Needs to Know*, New York City, New York: Dell Publishing, 1996. 890517-20-8.

G. Jordan, H. *How a Seed Grows.* New York, New York: Harper Collins, 1992. 0-06-445107-0

H. National Geographic Educational Film. Insects 595.7.Ins 1994.

I. National Geographic Society Film Wonders of Learning Kit Insects and How they Grow. 595.7 Insects.

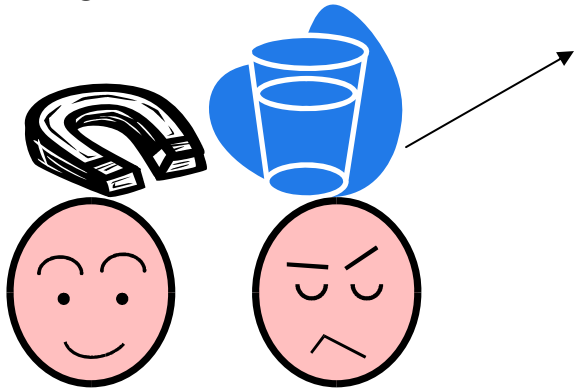
J. *Webster's Dictionary Plus Thesaurus.* USA: Nickel Press, 1993, 1-879424-42-8.

Appendix A

Will The Magnet Still Work?

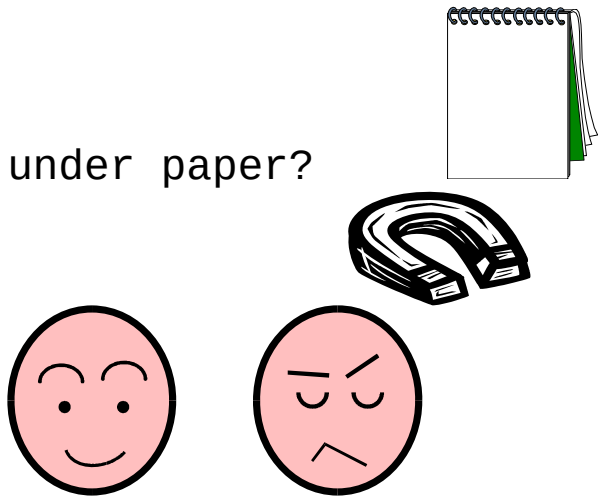
Name_____

Will the magnet attract in water?



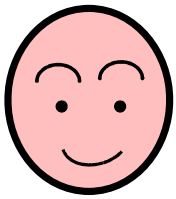
Ye No

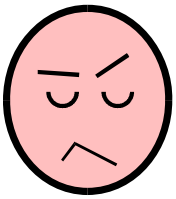
Will the magnet attract under paper?



Ye No

Will the magnet attract under_____?

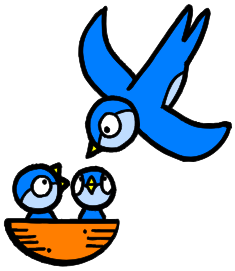


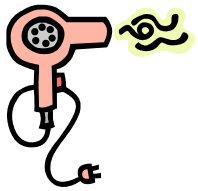


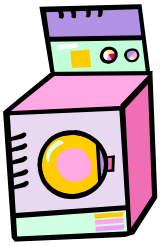
Ye	No

Appendix B

Class Magic Noise Sequence



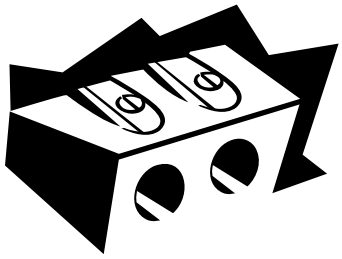


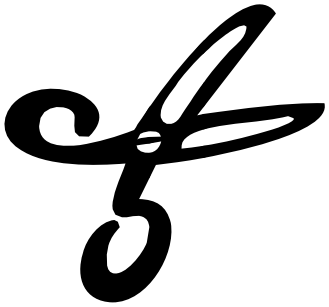


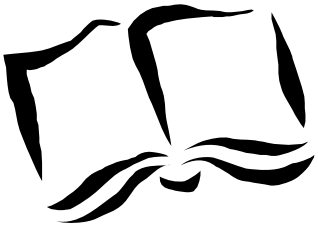
Name_____

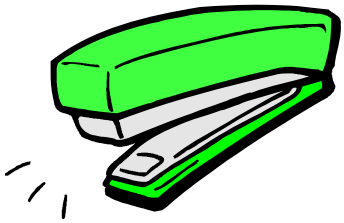
Appendix C

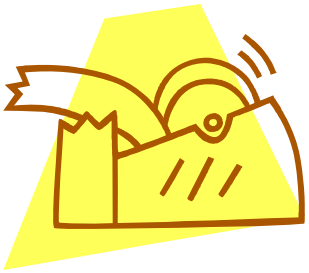
Group Magic Noise Sequence

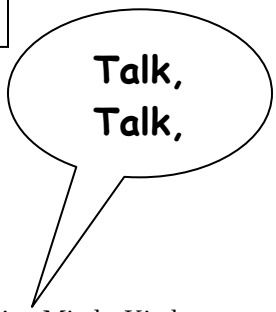












Appendix D
Five Senses-Listening Journal Page

I can hear with my ears!

Appendix E

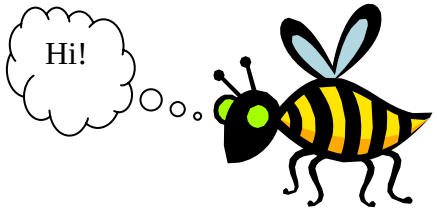
Insect Voting Cards

1.  ant
2.  bee
3.  butterfly
4.  dragonfly
5.  katydid
6.  ladybug
7.  moth
8.  praying mantis
9.  stink bug
10.  wasp

1.  ant
2.  bee
3.  butterfly
4.  dragonfly
5.  katydid
6.  ladybug
7.  moth
8.  praying mantis
9.  stink bug
10.  wasp

Appendix F
Inquiry Questions Recording Sheet

How do bees communicate?



Appendix G
Inquiry Questions Recording Sheet

Where do bees live?

Appendix H
Inquiry Questions Recording Sheet

What is the lifecycle of the bee?

Appendix I
Inquiry Questions Recording Sheet

How do bees make honey?

Appendix J

Plant Observation

What do you notice about your plant?

Name:_____