I am a Scientist

Summary

Students learn about the scientific method while using the skills of predicting, experimenting, communicating, writing, and inferring.

Group Size

Large Groups

Materials

Invitation to Learn
- *What is a Scientist?*
  Bolded words

Instructional Procedures
- *Scientific Method*
- *Scientific Method poster*

Experiment # 1 - Water Break Down
- *Scientific Method*
- Water Break Down
  Wax paper
  Eyedroppers
  Toothpicks
  Water
  Liquid dish soap

Experiment #2 - Go With the Flow
- *Scientific Method*
- Go With the Flow
  Water bottles
  Mineral oil
  Food coloring
  Water

Experiment #3 - On the Move
- *Scientific Method*
- On The Move
  Large container
  Small container
  Food coloring
  String

Experiment #4 - A Rainbow of Colors
- *Scientific Method*
- A Rainbow of Colors
  Coffee filters
  Washable marker
  Eyedroppers

Experiment #5 - Crazy Comics
- *Scientific Method*
- Crazy Comics

Clear cup
Comic strip

Additional Resources

Books

What is a Scientist, by Barbara Lehn; ISBN 978- 0761312987
Let's Try It Out in the Water, by Seymour Simon and Nicole Fauteux; ISBN 0-439-40914-4
Splish, Splash, Science, by Rebecca Olien; ISBN 0-590-1595-2
The Snowy Day, by Ezra Jack Keats; ISBN 0-670-86733-0

Background for Teachers

The Science process occurs naturally, spontaneously in our minds. By logically breaking down the steps in our thinking, we can use science process to find out how to answer our questions about how the world works. The science process is not just useful in science, but in any situation that requires critical thinking. The science process skills include observing qualities, measuring quantities, sorting/ classifying, inferring, predicting, experimenting, and communicating. The following lesson will teach the students how to use the scientific method in conjunction with the science process skills. When the students are asking questions and forming hypothesis they will be using the skill of predicting. They will be experimenting and communicating during the experimenting step. When they write and draw observations, they are observing qualities, measuring quantities, and sorting/classifying. When forming conclusions the students are inferring. Finally, when the students share and discuss they are communicating.

Intended Learning Outcomes

6. Communicate clearly in oral, artistic, written, and nonverbal form.

Instructional Procedures

Invitation to Learn

Ask the students who can be a scientist? Can only boys or girls be a scientist?"
Read the book *"What is a Scientist"* by Barbara Lehn and discuss each of the pictures.
Tell the students that you are going to make a class book similar to the one you just read. With a partner, the students will illustrate a picture that represents a page from the book.
Pass out paper to each of the partnerships that have the bolded words from each page of the book written at the top.
When students have completed the task, have them share with the class. After binding the book, have it available for the students to read.

Instructional Procedures

Tell the students that they are going to be Hydrologists (scientists that study water).
Explain to the students that, as you read in *What is a Scientist?*, there is a process that all scientists use to gather information and learn new things. This is called the Scientific Method. First, they need to ask a question. Next, they need to form a hypothesis (A hypothesis making a guess about what you think will happen. It may or may not end up being correct). Then they need to test their hypothesis by performing an experiment. They will observe the experiment and write and draw what they see. Last they will form a conclusion and then share and discuss their results with others (A conclusion is when we come to a final idea about what happened).
Give the students their *Scientific Method graphic organizer* and tell them that they will be using their journals through each step of the process while conducting water experiments.
Display the poster size *Scientific Method graphic organizer*. Explain the format of the Scientific Method graphic organizer. Each step of the process has an icon and words that explain what to do and explain what they need to write or draw. The students will use the boxes next to the icon

to write or draw in (the teacher will use the poster size *Scientific Method graphic organizer* throughout the first experiment while the students use theirs).

Conduct the first experiment as a class to guide them through the process (this can be done with any kind of science experiment).

Experiment # 1 Water Break Down

Question: How does water break apart?

a) Have the students write this question on their *Scientific Method graphic organizer* next to the question mark icon.

b) Have the students discuss with a partner how they think this happens. Have them record their hypothesis next to the light bulb icon.

c) Give each child a square of waxed paper, an eyedropper, a toothpick and a small cup of water. Have the students drip several drops of water on the waxed paper. Use the toothpick and poke the drops of water.

d) Have the students record what happened by writing or drawing what they did next to the beaker icon.

e) Give the students a drop of liquid soap. Have them dip their toothpick into the soap and poke their water drops.

f) Use pictures or words to record their observation next to the glasses and clipboard icon.

g) Have the students come to their own conclusions and record it next to the person thinking icon.

h) Have the students get in groups to share and discuss what they observed and the conclusion they came to.

i)Write any additional information next to the people talking icon.

Explain to the students that they will be able to practice the Scientific Method by performing additional experiments. They will be working in groups and will use their graphic organizer the same way you just did as a class.

At each water station, post the question that needs to be answered by performing the experiment.

Divide the students into groups, explain the experiments and conduct the experiments.

Experiment #2 - Go With the Flow

Question: What will happen if I mix oil and water?

Fill 4-6 empty water bottles 14 with mineral oil.

Add three drops of food coloring.

Fill the rest of the bottles with water.

Spin the bottles slowly, quickly and then shake them.

Record information on graphic organizers

Discuss and share as a group.

Experiment #3 - On the Move

Question: Why is my soup hotter at the top of my bowl when I take it out of the microwave?

Fill a large, clear, plastic container with cold water.

Fill a smaller clear, plastic container with hot water.

Add two drops of food coloring to the hot water.

Tie a string to the neck of the smaller container and lower the smaller container of hot water into the large container.

Watch as the hot water is dispersed into the cold water.

Record information on graphic organizer.

Discuss and share as a group.

Experiment #4 - A Rainbow of Colors

Question: Can water make colors change?

Give each student a coffee filter, water dropper, and a black watercolor marking pen.
Have the students make a black dot in the middle of the coffee filter.
Using the water dropper, drip one drop of water on the black dot.
Record information on graphic organizers.
Discuss and share as a group.

Experiment #5 - Crazy Comics

Question: Can water make pictures move?

Give each child a clear glass of water.
Put a comic strip behind the glass of water.
Make observation
Put the comic strip under the glass of water.
Make observation.
Record information on graphic organizers.
Discuss and share as a group.

Extensions

Curriculum Extensions/Adaptations/ Integration

Using coffee filters, give the students a variety of watercolor markers and have them create designs on the coffee filters. Have them drop water on the colors. Create an art project with the coffee filters.
Have the questions pre-typed onto the *Scientific Method graphic organizer*.
Compile all the *Scientific Method graphic organizers* into a science journal.
Allow students to draw pictures instead of writing on the *Scientific Method graphic organizer*.

Family Connections

Give the students a copy of the *Scientific Method graphic organizer*. Have them conduct one of the experiments at home with their family and show them how to use the organizer.
Invite parents to come to school and help with the experiments.

Assessment Plan

Use the *Scientific Method graphic organizers* for assessment.
Have the students play concentration, matching the science process steps phrases and icons.
Observe the students as they are completing the experiments.
Create interview questions to see is they students can demonstrate or verbalize doing each step of the science process.

Bibliography

Research Basis

Bricker, P. (November 2002). Reinvigorating science journals, *Science and Children*. 24-29.
In this article the author was invited to participate in a grant project focused on integrating science and literacy. Several grades were observed during the project, and the author found that it is important to use literacy when teaching the scientific process and that journaling plays an important role.

Livingston, C. (November/December 2005). Journals of discovery, *Science and Children*. 52- 55.
While using Discovery Journals is her classroom, the author found that student learning is enhanced and the amount of knowledge that is retained over time is increased. By using integrated Discovery Journals, the author was able to see valuable insights into her teaching, reflect how engaged students were in learning a particular topic, and determine how successful or unsuccessful she was in portraying a particular science concept.

Authors

Utah LessonPlans