

ANSWERING CARNIVAL QUESTIONS WITH THE SCIENTIFIC METHOD

SCIENCE

KAREN MOODY AND JACQUI SHALLENBERGER

GRADES 2-3

Overview

This unit will introduce the procedure and vocabulary involved in using the scientific method. This lesson will provide visual and hands on experiences to help make abstract concepts more concrete and understandable for young students. (Prior to this lesson, students should have a basic understanding of the five senses and their role in observation activities.)

ITV Series

Reading Rainbow #1110 "Archibald Frisby"

Science for You #115 "Scientific Method: Who Needs Science?"

Learning Objectives

- The students will understand the purpose of using the scientific method.
- The students will be able to identify and use the steps of the scientific method to answer questions.
- The students will demonstrate their ability to use the World Wide Web to access specific information.

Vocabulary

Scientific method
Observation
Purpose
Hypothesis
Experiment
Conclusion

Materials

Each Class

Popcorn and popper
Circus music
Cotton candy
Enlarged "Carnival Sensations" worksheet
Chart paper and markers
Scientific Method sentence strips

Each Group of two students

Word cards
Letter cards
Hand mirror
Glue
Record sheets for
"House of Mirrors" activities

Each student

"Carnival Sensations" worksheet
pencils

Pre-Viewing Activities

For this activity, the students will be seated in the classroom. The teacher will dim the room lights and turn on the flashing holiday lights, start the popcorn popper, begin the circus music, and give each student a bag of cotton candy.

The teacher will then **SAY**, "Raise your hand if you have ever been to Six Flags, the State Fair, or a carnival?"

As the students raise their hands and discuss their experiences, list the places they have been on the chart tablet. Read the list of all the places they have been

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and **SAY**, "Today we are having a similar carnival experience in our class. You are going to use your five senses to gather information. Think of things you are able to see, hear, smell, touch, and taste at a carnival. To complete the investigation sheet you can think of today's class carnival or the other places you have been."

Pass out the "Carnival Sensations" worksheet to each student. Have the students individually complete the page by drawing or writing responses in the appropriate balloons.

Then, as a class, have the students share their observations and record their responses on the enlarged copy of their worksheet.

Focus on Viewing

SAY, "We have made a list of the things we have seen, heard, smelled, touched, and tasted at the carnival. We are not the only ones who enjoy a carnival environment. We are going to watch a small part of a video that shows Levar Burton at Six Flags. He is wondering about several things." To give the students a focus for viewing, **SAY**, "Listen for three things Levar is wondering about after his roller coaster ride. "

Viewing Activities

ITV Series

Reading Rainbow #1110 "Archibald Frisby"

The teacher should have the *Reading Rainbow* video "Archibald Frisby" **PRESET. BEGIN** the video immediately after the introduction and the words "hosted by Levar Burton." The visual is the people on the roller coaster. The audio is people screaming.

PAUSE the video when Levar says, "Why do we love scary rides so much?" To check comprehension, **SAY**, "What were the things Levar was wondering about?" Allow time for responses.

To highlight the point, record the following questions on the chart paper, skipping spaces between each question, in order to later record his observations. Write: Levar wonders-

- How they get it to go so fast?
- How does the coaster stay on the track?
- Why do we love scary rides like this so much?

FAST FORWARD the video past the visual "The End". The screen shows Levar at the bottom of a ramp standing in front of the roller coaster. He says, "Now, you would be surprised at the things you could figure out simply by

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observing." To give students a specific responsibility for viewing, **SAY**, "Levar is going to look for answers to his questions. Look and listen to what he discovers by observing." **RESUME** video.

PAUSE video when Levar says, "that's something that scientists do everyday." **PAUSE** and **REWIND** the video to the beginning of this segment to the visual of the roller coaster showing the three wheels on the track. **SAY**, "Does he answer all of his questions by observing?" Point to the list of his three questions. (Elicit these responses: only two can be answered by observing; the third question is an opinion and is not observable, not science.)

To enhance student observation skills and reinforce the concept, have a student come to the TV and explain the answer to the question about the car staying on the track as you **MUTE** and **REPLAY** the video. **PAUSE** video at the end of the scene to record the explanation.

FAST FORWARD video to the visual of the chain pulling the train to the top of the first big hill. Again, to enhance the student observation skills and work at the screen, ask a student come to the TV and explain the way a roller coaster is able to go so fast without a motor. **MUTE** and **RESUME** video. **PAUSE** video at the end of the scene to record the explanation.

FAST FORWARD the video past the visual of the space shuttle. The video shows Levar standing in front of a carnival game. Levar says, "Taking a closer look can often answer your questions." **PAUSE** and **REPLAY** this segment in order to highlight a point. **SAY**, "In the next segment, Levar is going to show you another strategy to help you figure things out. Raise your hand when you hear the name of this strategy." **RESUME** the video.

PAUSE when he says the term "trial and error;" students should be raising their hands. Write the term on the chart paper.

REWIND the video to the beginning of the segment. To reinforce the vocabulary, **SAY**, "Levar is going to use the technique called 'trial and error'. Watch to see if you can determine what it means to do trial and error." **RESUME** the video and **STOP** when he says, "different ideas, use some trial and error."

To check comprehension, **SAY**, "Who can explain trial and error?" Record the student responses on the chart paper under the words trial and error. Incorporate the terms—"experiment, try a different approach, and a different way to do it."

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ITV Series

Science for You #115 "Scientific Method: Who Needs Science?"

SAY, "How many of you have ever been in a Glass House or a Fun House at the carnival? I am sure you noticed that it changed the way you looked. Today, we are going to do an experiment using mirrors, word cards, and letter cards. We will call our experiment the House of Mirrors."

Distribute one set of word cards and a one hand mirror to each pair of students. **SAY**, "Let's work with these cards and see how they look in the mirror. Remember, asking good questions is the first step in the scientific method." Have the students predict what might happen to the words. **SAY**, "What are some scientific questions you can think of that involve our mirrors and word cards?" Record the student responses.

PRESET the video by **FAST FORWARDING** to the visual of the boy and girl sitting in front of the mirror. The screen shows the words "Experiment: Scientific Method." Display the sentence strip for "Scientific Method." To give the students a specific responsibility for viewing, **SAY**, "As we watch this video segment we will see a boy and girl act like scientists. Watch the things they do. Listen to see what questions they are going to try to answer?" **BEGIN** the video.

PAUSE video when the boy says, "How come some stay the same and others don't?" To compare their predictions with the students on the video, **SAY**, "What question did the boy come up with?" Display the sentence strip "Make a Guess/Hypothesis."

To refocus the students attention, have them watch for what the boy and girl are going to do to answer the question. **RESUME** play.

PAUSE when the boy says, "but hood and hike are just regular old words." To check for comprehension, **SAY**, "What did the students do when they started each sentence with 'could it be?'" Point to the sentence strip "Guessing/Hypothesizing." Ask for a definition. (Making guesses that could answer the question.)

SAY, "In the next segment they are going to classify the words. What two groups would you make?" In order to refocus the attention of the students, **SAY**, "Watch and see if they classified in the way you predicted." Display the sentence strip "Classifying." **SAY**, "They will test the letters to determine which letters stay the same and which letters do not."

In order to have the students check their inferences, **SAY**, "Look and listen to see if the boy and girl figure out an answer to

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their question. See if they reach a conclusion about which letters reverse and which letters stay the same?" **RESUME** video.

PAUSE the video after the students start making predictions. Display the sentence strip "Conclusion." **SAY**, "Then, they test the letters by making words with the letters." In order to reinforce the concept, **RESUME** video and **PAUSE** when the girl says, "and here they are cookbook and icebox." Display the sentence strip "Inferring."

At this point you should have completed the chart of sentence strips which displays the following:
Scientific Method
Questioning
Guessing/Hypothesizing
Experimenting
Concluding
Inferring

RESUME the video with the sound **MUTED**. To check comprehension, as the vocabulary words flash on the screen, have the students narrate the last segment. **REPEAT** the process until the students have a clear understanding of the order of the steps and the meaning of each. **STOP** the video at the screen displaying the term "Inferring."

For assessment, remove the strips from the board. Distribute each strip to a different student. Have the students

work together to arrange the strip in order, then call on someone to explain what is involved in each step. Go to the next step and continue until all students have had a turn.

Post-Viewing Activities

In this activity, the students will replicate the experiment they have seen on the screen. Distribute a set of word cards, the worksheet labeled "House of Mirrors," and a hand mirror to each pair of students. Allow the students to duplicate the experiment from the video using their own word and letter cards. Explain that the students are to pretend they are working in the House of Mirrors. They must decide what words can be posted on the wall in the Fun House. They are to use the Scientific Method to complete this activity. They will write the question, experiment with letters to determine which will reverse and which will not, and then use the information to make words that will reverse. Students will be assessed according to successful completion of the worksheet.

Write ten addition and subtraction word problems about the carnival in our classroom. These could be fact or fiction!

Have students trade their papers and solve.

Copy and distribute these research plans with Internet connections to the students. Require students to select and

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complete an activity from this collection to be presented to the class at a later point. Allow students class time to perform their research.

- If you think you would like to be a clown with the carnival, you will need a Bubble Bomb. Access this web site for directions, take it home and complete it with a parent's help.
http://www.exploratorium.edu/science_explorer/bubblebomb.html
- If you would like to design a new ride for the midway, you will need a Spinning Blimp. Access this web site for directions, take it home and complete it with a parent's help.
http://www.exploratorium.edu/science_explorer/spinning_blimps.html
- If you would like to sell balloons at the carnival you will need to blow them up. Access this web site for directions, take it home and complete it with a parent's help.
http://www.exploratorium.edu/science_explorer/balloon_blowup.html
- Go to the library and research the history of the circus or carnival.
- Use various resources: books, the Internet, or encyclopedia. Write a report and present it to the class.
- Make up three questions related to our lesson. Use the web site Askjeeves to get an answer.
Example: What makes popcorn pop?

- Read about the Scientific Method at the website Biology4kids. Write what might have happened if the boy and girl had not used the scientific method to answer their question.
- Levar left one of his questions unanswered. He was wondering why people love scary rides so much. Do a little research using library books, Internet and questionnaires to friends and family. Make a chart to describe your data. Then ask yourself, "Do I think I would like to ride the large roller coaster at Six Flags that Levar rode?" Write a paragraph to explain your opinion.

Action Plan

Collect articles on people who use the scientific method from the *Weekly Reader*, magazines and newspaper. Display them on a bulletin board. Discuss the steps of the scientific method in relation to the specific person.

Bring in professionals from different fields and ask them to discuss how real life problems can be solved by using the scientific method.

Take students on a field trip to a museum, or activity center where the scientific method is being used, or was used in making a discovery. Have students write a story about why we need science and the scientific method to solve problems.

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Resources

Books

What Makes Popcorn Pop? by Dr. Jack Myers
Archibald Frisby by Michael Chesworth
Science Magic Series by Chris Oxlade
I Wonder Why Soap Makes Bubbles by Barbara Taylor

Internet

Sites to bookmark:

http://www.kapili.com/biology4kids/study/mt_hod.html

http://www.pbs.org/wgbh/zoom/some/sci/sod_abottleboat.txt.html

http://www.pbs.org/wgbh/zoom/some/sci/sub_race.txt.html

<http://www.askjeeves.com>
<http://www.yahooligans.com>

http://www.exploratorium.edu/science_explorer/bubblebomb.html

http://www.exploratorium.edu/science_explorer/balloon_blowup.html

http://www.exploratorium.edu/science_explorer/spinning_blimps.html
