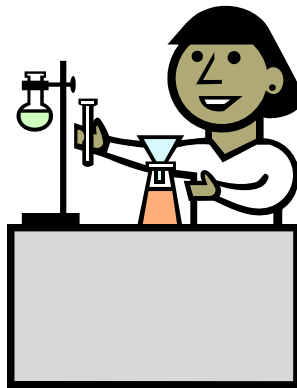


Dr. Mad Scientist

Pre-Visit Activities

Grades K-2



Standards of Learning

The following Standards of Learning are addressed in the Junior Mad Scientist Demonstration.

- K.1 The student will conduct investigations in which
 - a) basic properties of objects are identified by direct observation;
 - e) a set of objects is separated into two groups based on a single physical attribute;
 - f) nonstandard units are used to measure common objects;
 - g) a question is developed from one or more observations;
 - h) picture graphs are constructed using ten or fewer units;
 - j) unusual or unexpected results in an activity are recognized.

- 1.1 The student will conduct investigations in which
 - a) differences in physical properties are observed using the senses;
 - b) simple tools are used to enhance observations;
 - c) objects or events are classified and arranged according to attributes or properties;
 - d) observations and data are communicated orally and with simple graphs, pictures, written statements, and numbers;
 - e) length, mass, and volume are measured using standard and nonstandard units;
 - f) predictions are based on patterns of observation rather than random guesses;
 - g) simple experiments are conducted to answer questions.

- 2.1 The student will conduct investigations which
 - a) observation is differentiated from personal interpretation, and conclusions are drawn based on observations;
 - b) two or more attributes are used to classify items;
 - e) length, volume, mass, and temperature measurements are made in metric units and standard English units;
 - f) pictures and bar graphs are constructed using numbered axes;
 - g) unexpected or unusual quantitative data are recognized.

Activities

These activities are intended for use before your visit to the Virginia Air and Space Center. It is beneficial for the students to have some prior knowledge about the content area covered in the program. All of the activities can be tailored to your specific classroom needs, and the procedures listed are suggestions for teaching.

Activity 1: Sock Activity

Review with your students about their five senses. Tell the students that scientists use their senses as they learn about the world around them. Ask students if they like to be detectives and solve clues. Tell them scientists use clues to solve “scientific” mysteries. In order to solve “scientific” mysteries, scientists sometimes need to use some of their five senses.

Take some old socks (baby or small socks work great) and put different items into them. You can use all white socks and label them with a marker A, B, C, and D; or you can use colored socks so that the students can identify the socks by the color. There are all different kinds of objects that you can put inside of the socks. You can make this easy or very difficult. Some ideas of items to put in the socks are sand, a small pinecone, beans, etc. Split the class into teams of three or four students. You will need about four different socks for each team. You can use the same materials in each set of four socks or you can have all different materials for all of the teams. Tell the students that they are teams of scientists and they must use their senses to determine what objects are in the socks. Remind the students that for this activity the sense of taste is not recommended.

The students can identify the items with or without clues. You can let the students know they need to identify which sock has the beans in it, which one has the pinecone in it, etc. If this is too easy, you can let the students try to come up with what they think the object inside of the sock is on their own.

Activity 2: Film Canister Activity

The film canister activity is similar to the sock activity, however this time the students can only use their senses of hearing and touch (shaking and feeling the vibration of the object in the film canister). The film canister (black ones with black or gray lids-clear ones are not recommended for this activity) eliminates using the sense of sight because students cannot make out the shape of the object, smell is not helpful because the film canister is airtight, and taste, once again, is not recommended. If you would like to use the sense of smell only, you can saturate a cotton ball with scented oil and let the students open the film canister to smell the canister, then try to decide what makes that scent.

Split the class into teams of three or four students. You will need about four different film canisters for each team. You can use the same four materials for each set of four film canisters or you can have all different materials for all of the teams. Be sure to label the lids of the film canisters so that the students can identify the objects by the number or letter of the film canister. Tell the students that they are teams of scientists and they must use the appropriate senses to determine what objects or scents are in the film canisters.

The students can identify the items with or without clues. You can let the students know they need to identify what film canister has the rice in it, which one has the marble in it, etc. If this

is too easy, you can let the students try to come up with what they think the object inside of the film canister is on their own.

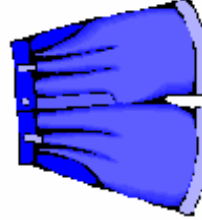
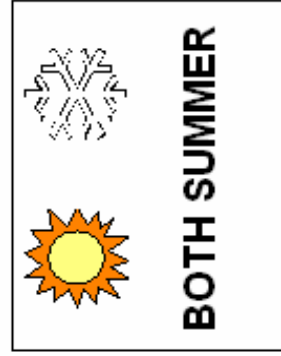
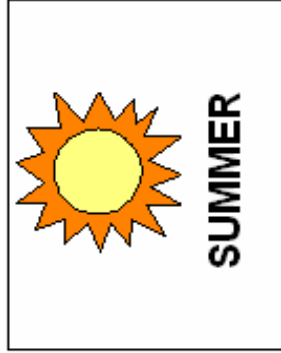
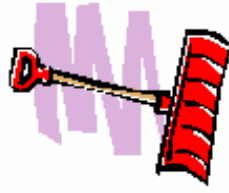
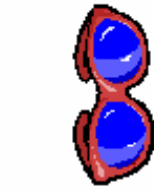
Activity 3: Compare and Contrast

Tell students that scientists make observations all of the time and it is an important part of their job. Remind the students that they have used their senses to make observations in the previous activities and for this activity they will use their background knowledge to compare and contrast objects. Use the Venn Diagram model on the chalkboard to compare and contrast objects that students typically use or see at home and at school. Label one circle “Home” and the other circle “School”. If they feel it is something they would use or see in both places, place it in the middle where the two circles overlap each other. Some examples of items to use are: a bus, chalk, desk, bulletin board, principal, teacher, paper, etc.

Use the attached activity page for an additional compare and contrast activity.

Name _____

Please look at the pictures below. Decide in which season, winter or summer, we use the item. Some of the items can be used in both seasons. Draw a line from the picture to the correct season.



Resources

Books

Sorting Henry Pluckrose (**Know About Series, Franklin Watts, 1988**). The brief text has questions which will start a child thinking about different ways in which objects can be sorted – by size, color, type (toy animals or buttons). It introduces set theory by showing how things can be sorted into different sets.

Capacity Henry Pluckrose (**Know About Series, Franklin Watts, 1988**). Starts the child thinking about how much liquid or marbles a jar holds, and how to compare them, and leads to our standard measure of volume, the liter.

Weight Henry Pluckrose (**Know About Series, Franklin Watts, 1987**). Introduces the concept of weight, and how to weigh things.

How little and how much: A book about scales Franklyn M. Branley. This is not a book about weighing. Rather it is an excellent introduction to the concept of scale in mathematics. Beginning with scales of 1 to 10 for how much you like ice cream, the text progresses to measuring height and temperature in ways that other people will understand. Scales for measuring earthquakes and hurricanes are also mentioned.

What is a Scientist? Barbara Lehn, 1999. This engaging book demonstrates what a scientist is by equating the hands-on, investigative curiosity of first-grade students with the scientific method of inquiry. Colorful photographs of the children at work employ a multi- cultural collection of real students as models.

Places

NASA Langley ERC at the Virginia Air and Space Center
600 Settlers Landing Road, Hampton, VA 23669-4033
Phone: (757) 727-0900 ext. 757

www.vasc.org/erc

E-mail: blee@vasc.org

**Many posters, lithographs and activities are available through the ERC. Please come in, call or e-mail your requests.