

Cub Scouts STEM/Nova Exhibit Guide

Science Everywhere



1. A. Watch *Humpback Whales* in the IMAX Theater and then think about the questions below. For more videos and information about this film, check out the companion website <http://www.humpbackwhalesfilm.com>. (Check with your parents or counselors first.)

1. What topics in the film were you most interested in?
 - a. songs for communication
 - b. migration
 - c. feeding habits
 - d. the health of the Antarctic ecosystem
 - e. rescue missions of entangled or distressed whales
 - f. whale hunting
 - g. something else

2. List at least two questions or ideas from what you watched.

3. Discuss these questions or ideas with your counselor.

3. Act like a scientist! Can you find a question to investigate while you are here in the museum? Below are some examples that can be done here or you may find another area of the museum that sparks a question for you. In part B, you will be asked to use the scientific method to investigate your question. You can do some or all of those steps during your visit, but you may want to save some steps for further exploration at home or with your Pack.

A. While you are exploring exhibits, choose one of the following interactives to investigate in depth. Spend some time at the interactive, and then think about the questions listed.

1. In the Giant Heart Exhibit on the 2nd floor, go to “Going Through the Motions” to explore the path of blood as it flows through the heart. Why do you think blood only takes this one path? Why do you think blood enters and leaves the heart twice? Why do you think the heart has so many chambers? Walk through the Giant Heart or watch the 3D video across from the heart to see if that gives you more ideas.



2. In the Electricity Exhibit on the 2nd floor, go up on the platform to “Can you complete a Circuit” and “How do I build a Circuit.” Sketch what your completed circuit looked like. What was the most number of parts you used to complete a circuit? What was the least number of parts you used to complete a circuit? What shape does a completed circuit resemble most? Where do you find circuits around you every day?



3. In the Changing Earth Exhibit on the 2nd floor, go to “Find out about your Carbon Footprint.” How big was your carbon footprint? Was your carbon footprint bigger or smaller than other Scouts? Are there any ways you or your family can work to make your carbon footprint smaller?



4. In the Franklin Air Show Exhibit on the 2nd floor, go to the “Air Pressure Arcade.” Can you make the ball float in the column of air? What can you do to change the pattern of air flow to change how well the ball floats? Can you get other objects to float in the column of air (empty water bottle, empty paper cup, piece of paper)?



5. In the Train Factory on the 1st floor, go up on the platform to “Design a Train” touchscreen. Sketch (or email yourself) your successful train design. Why do different trains need different designs? What have you seen transported on a train before? Do the different train designs remind you of the designs for cars, trucks or other vehicles?



B. Using the interactive you choose above, use the scientific process to investigate your questions. Record your data in the sections below.

1. Ask a question. What do you want to know more about? Do you think you could discover something about your question here at the museum? (If not, you may want to continue the rest of this activity later.)

2. Do some research. What information about your question can you find in the museum exhibits? How else could you find out what people or scientists already know about your question?

3. Make a hypothesis. What do you think is the answer?

4. Test your hypothesis with an experiment (or more than one!). Can you do your test here at the museum? Write down what you do, and what the results are.

5. Was your hypothesis supported by the results of your tests? What new questions do you have based on your results?

6. Share what you learned.



3. B. In Space Command on the 1st floor, go to the “Moon Mobile.” Stand on the circle under the moon and pretend to be the Earth. Watch the moon revolve or orbit you.

- How long does it take the moon to make one revolution around the Earth?
- How long does it take the Earth to make one revolution around the Sun?

Now slowly spin yourself in a circle as you model the Earth rotating on its axis.

- How long does it take the Earth to make one rotation on its axis?

1. Take a look at the orrey (giant glass sphere) to choose three planets to investigate. Fill in the chart below. Some answers can be found around Space Command, for the others check out the website, <http://solarsystem.nasa.gov/planets/>

	Earth	Planet 1	Planet 2	Planet 3
Length of year				
Length of day				
Distance from sun				
Diameter				
Temperature				
Number of moons				

2. Discuss what you have learned with your counselor.

3. C. In the Space Command Exhibit on the 1st floor, go to the Rove-a-Rama and Remote Command areas. Using the K’NEX design a model Mars rover that could explore the planet’s rocky surface. Sketch your design below. Also, take a photo to show your counselor.



Now explore the other interactives and record the following about your rover:

What kind of data would it collect?

How would the rover work?

How would the rover communicate with Earth?

Why are rovers needed for space exploration?



4. A. Stop by the Joel Bloom Observatory on the 4th floor (weather permitting).

1. Talk to the staff or volunteers in the Observatory and ask them some questions like:
 - a. What kinds of objects in the sky are best seen through these telescopes?
 - b. What can visitors learn by getting a closer look at these kinds of objects?
 - c. What are some of the different types of filters used by these telescopes? And what information can the different types of filters show?
 - d. What are other objects in the sky that could be seen with an optical telescope that can't be seen in our Observatory?
 - e. Do you have your own questions?
2. Share your findings with your counselors, parents, or fellow Scouts.