



SCIENCE EVERYWHERE

1. Watch or read. Choose a, b, or c and complete all the requirements:
 - a. Watch an episode or episodes (about an hour total) of NOVA or other media production* about animals, rockets, tornadoes and hurricanes, the environment, or anything science related.
 - i. Make a list of at least two questions or ideas from each production
 - ii. Discuss the ideas and questions with your counselor
 - b. Read one long or two short magazine articles** about animals, rockets, tornadoes and hurricanes, or the environment.
 - i. Make a list of at least two questions or ideas from the article(s)
 - ii. Discuss the ideas and questions with your counselor
 - c. Do a combination of reading and watching
 - i. Make a list of at least two questions or ideas from the article or production
 - ii. Discuss the ideas and questions with your counselor
2. Complete one belt loop or pin from the following list. (Choose one that you do not have.)

Astronomy
Collecting
Geography
Geology
Map & Compass
Nutrition

Pet Care
Photography
Science
Weather
Wildlife Conservation

3. Act like a scientist!

- a. With your counselor, choose a question you would like to investigate.

Examples (you may get other ideas from your belt loop activities):

1. Why do rockets have fins? Is there any connection between the feathers on arrows and fins on rockets?
2. Why do some cars have spoilers? How do spoilers work?
3. Where does water from the creek in your neighborhood go? Does your stream flow to the Atlantic or the Pacific Ocean? (You may wish to use Google maps to follow the streams and rivers to the ocean. Keep track of the names of the streams, lakes, and rivers connecting your stream to the ocean. A fun book to read is *Paddle to the Sea* by Holling C. Holling.)
4. Is the stream in your neighborhood or park polluted? (You can do a stream sample to investigate what kinds of things are living in the water and under the rocks – some things live in polluted water, others can only live in clean water. You can discover if a stream is polluted by investigating what lives there.)

- b. With a parent or your counselor, use the scientific method to investigate your question. (You may do this section with another Cub Scout if you wish, but you need to do and record your own work.)

Keep records of your question, what information you found, how you investigated, and what you found out about your question.

- c. Discuss your investigation and findings with your counselor.

4. Visit

- a. Visit a place where science is being done, used, or explained.

i. Examples:

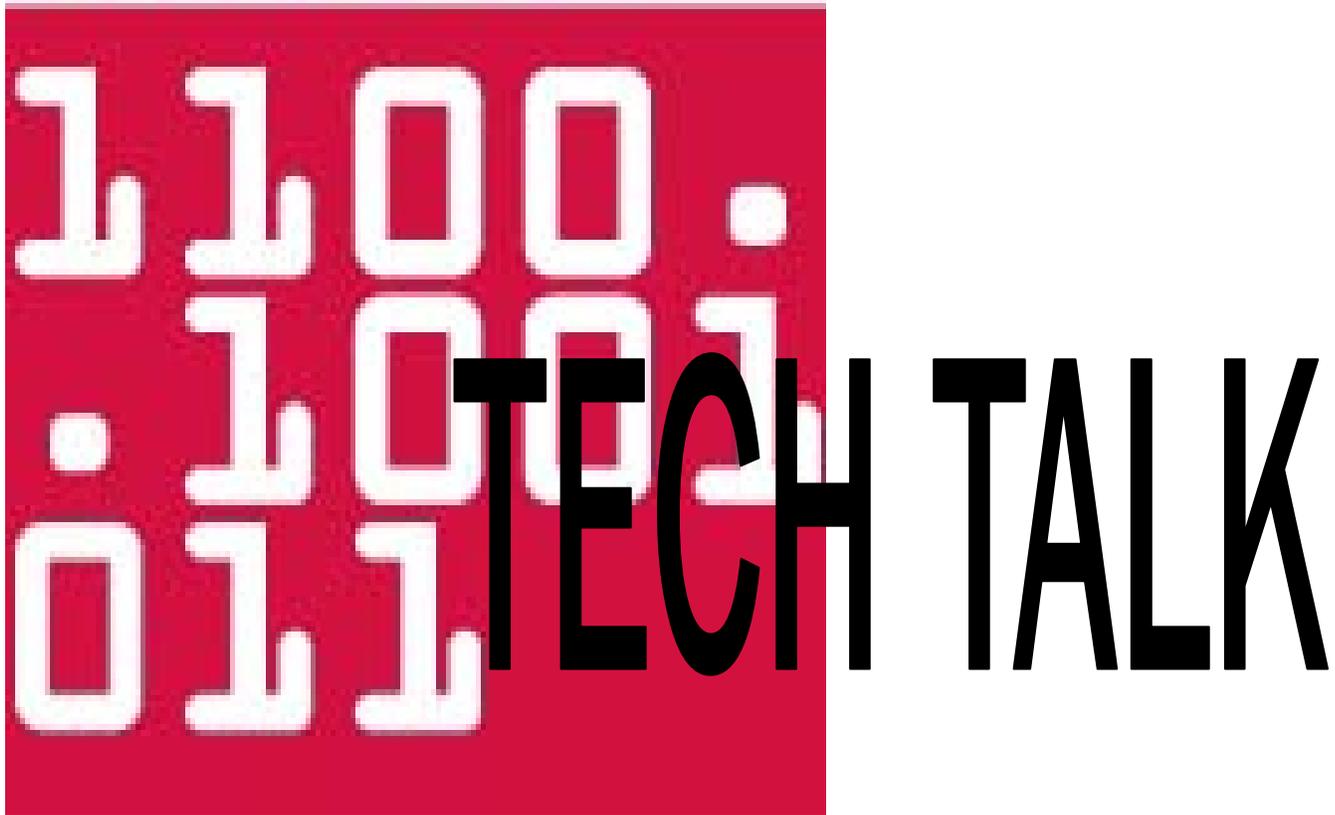
1. Zoo
2. Aquarium
3. Water treatment plant
4. Observatory
5. Science museum
6. Weather Station
7. Fish Hatchery

- b. Talk to someone in charge about science.

- c. Discuss with your counselor the science done, used, or explained at the place you visited.

*(Some media examples are the Discovery Channel, Science Channel, National Geographic, and the History Channel.)

** (Examples of magazine sources include Odyssey, Know : the Science Magazine for Curious Kids, Kids Discover, National Geographic Kids, Owl or OWLkids Online. You may wish to look at an article from Popular Mechanics or Popular Science with one of your parents.)



1. Look up a definition of Technology and discuss it with your counselor.
2. Watch or read. Choose a, b, or c and complete all the requirements:
 - a. Watch an episode or episodes (about an hour total) of NOVA or other media production* that involves technology or how technology is used.
 - i. Make a list of at least two questions or ideas from each production
 - ii. Discuss the ideas and questions with your counselor
 - b. Read one long or two short magazine articles** that talk about technology or how it is used.
 - i. Make a list of at least two questions or ideas from the article(s)
 - ii. Discuss the ideas and questions with your counselor
 - c. Do a combination of reading and watching
 - i. Make a list of at least two questions or ideas from the article or production
 - ii. Discuss the ideas and questions with your counselor
3. Complete a belt loop or pin from the following list. (Choose one that you do not have.)

Astronomy	Map and Compass
BB Gun Shooting	Music
Bicycling	Photography
Bowling	Snow Ski and Board Sports
Computers	Video Games

4. What technology is used in your belt loop or pin?
 - a. How do you think this technology
 - i. Was invented?
 - ii. Could be made better?
 - b. Discuss your ideas with your counselor
5. Discuss with your counselor, then
 - a. Visit a place of your choice that uses technology and
 - b. Talk to someone in charge about
 - i. The technologies used where you are visiting
 - ii. Why they use these technologies

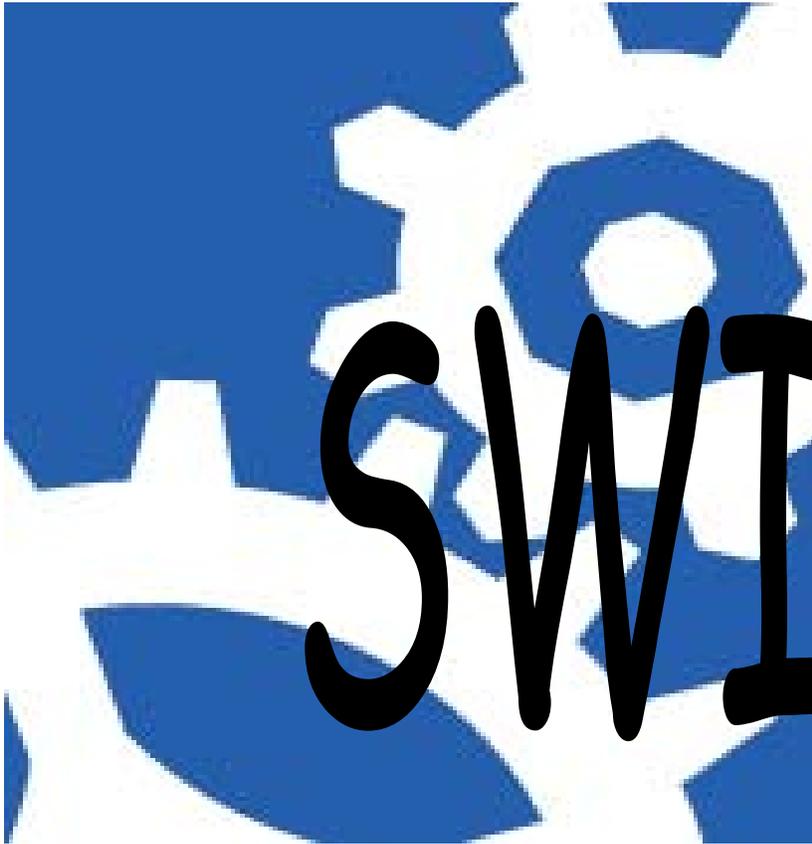
Places you might like to visit may include

- An amusement park
- A police or fire station
- A radio or television station
- A newspaper office
- A factory or store

6. Discuss with your counselor
 - a. how technology is used in
 - i. Communication (radio, TV, newspapers and magazines)
 - ii. Business
 - iii. Construction
 - iv. Sports
 - v. Entertainment
 - b. Why technology is important

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SWING!

1. Watch or read. Choose a, b, or c and complete all the requirements::
 - a. Watch an episode or episodes (about an hour total) of NOVA or other media production* that involves motion or machines.
 - i. Make a list of at least two questions or ideas from each production
 - ii. Discuss the ideas and questions with your counselor
 - b. Read one long or two short magazine articles** that show(s) how motion or machines is/are measured, used, created.
 - i. Make a list of at least two questions or ideas from the article(s)
 - ii. Discuss the ideas and questions with your counselor
 - c. Do a combination of reading and watching
 - i. Make a list of at least two questions or ideas from the article or production
 - ii. Discuss the ideas and questions with your counselor
2. Complete a Belt loop or Pin from the following list. (Choose one that you do not have.)

Badminton
Baseball
BB Gun Shooting
Fishing

Golf
Hockey
Softball
Table Tennis
Tennis

3. Levers
 - a. Make a list or drawing of the three types of levers
(a lever is one kind of simple machine)
 - b. Be able to tell your counselor
 - i. The class of each lever
 - ii. How it works.
 - c. With your counselor, discuss
 - i. The type of lever involved with the motion in your chosen Pin
 - ii. What you learned about levers and motion from doing your Pin
 - iii. Why we use levers
4. Visit –
 - a. A playground
 - i. Discuss with your counselor what playground or sports equipment uses levers
5. Design
 - a. Design, including a drawing or sketch, one of the following
 - i. A new playground fixture that uses a lever
 - ii. A new game or sport using a lever
 - b. Discuss with your counselor
 - i. How the lever in your design will move something

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1. Watch or read. Choose a, b, or c and complete all the requirements:
 - a. Watch an episode or episodes (about an hour total) of NOVA or other media production* that involve math or physics (math and physics are in almost every kind of invention – cars, airplanes, telescopes. Math also includes cryptology).
 - i. Make a list of at least two questions or ideas from each production
 - ii. Discuss the ideas and questions with your counselor
 - b. Read one long or two short magazine articles** that show(s) how scientists use math.
 - i. Make a list of at least two questions or ideas from the article(s)
 - ii. Discuss the ideas and questions with your counselor
 - c. Do a combination of reading and watching
 - i. Make a list of at least two questions or ideas from the article or production
 - ii. Discuss the ideas and questions with your counselor
2. Complete the Mathematics pin
3. Calculate. Choose two options from a, b, and c and complete all the requirements for those options. Keep your work to show your counselor – the necessary information to make your calculations may be found in a book or on the internet. (You may work with a parent or your counselor on these calculations.)
 - a. Choose two places and calculate how much you would weigh there.
 - i. On the sun or the moon
 - ii. On Jupiter or Pluto

- iii. On a planet that you choose
 - b. The height of (Do one)
 - i. A tree
 - ii. Your house
 - iii. A building of your choice
 - c. The volume of air in your bedroom (Volume=length x width x height. Make sure your measurements have the same units – all feet or all inches.)
4. Design – Secret Codes
- a. Look up, then tell your counselor
 - i. About Cryptography
 - ii. At least three ways secret codes or ciphers are made
 - iii. How secret codes and ciphers relate to mathematics
 - b. Design a secret code or cipher
 - i. Write a message in your code/cipher
 - ii. Share your code/cipher with your counselor

Links – to start your study

1. Calculations
 - a. Weight on other planets
 - i. http://www.essortment.com/all/weightonplan_rvrp.htm
 - ii. http://www.intrepidmuseum.org/Education/Teacher-Resources/documents/Space_9-12Post.aspx
 - b. Height of trees or other tall things
 - i. http://www.associatedcontent.com/article/5588962/how_to_calculate_the_height_of_a_tree.html
 - c. Volume of a room
 - i. http://www.ehow.com/how_2266390_calculate-volume-room.html
2. Secret Codes
 - a. <http://www.nsa.gov/kids/>
 - b. http://www.cerias.purdue.edu/education/k-12/teaching_resources/lessons_presentations/cryptology.html
 - c. <http://nrich.maths.org/2197>
 - d. <http://www.wikihow.com/Create-Secret-Codes-and-Ciphers>

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