ADVENTURES IN SCIENCE

SEPTEMBER HAC - WEBELOS / ARROW OF LIGHT ELECTIVE ADVENTURE

ADVANCEMENT TRACKING

A HomeScouting Adventure

While all the HomeScouting Adventure Club activities can be completed at home, they can also be completed at an in-person or virtual den meeting. Use the tracking tool below to record your completion of activities. This is for your use. See below for how to notify your den leader or unit leadership of completion of the adventure.

Requirement	Location Completed (circle)	Completed?
Complete the requirements below.		
1. An experiment is a "fair test" to compare possible explanations. Draw a picture of a fair test that shows what you need to do to test a fertilizer's effects on plant growth.	**At Home** **Den Meeting**	
2. Visit a museum, a college, a laboratory, an observatory, a zoo, an aquarium, or other facility that employs scientists. Prepare three questions ahead of time, and talk to a scientist about his or her work.	**At Home** **Den Meeting**	
3. Complete any **four** of the following *(some of the requirements are listed for brevity, see the Webelos/AOL Den in the ClubHouse for details):* a. Carry out the experiment you designed for Requirement 1. b. If you completed 3A, carry out the experiment again but change the independent variable. c. Build a model solar system. Chart the distances between the planets so that the model is to scale. d. With adult supervision, build and launch a model rocket. e. Create two circuits of three light bulbs and a battery. Construct one as a series circuit and the other as a parallel circuit. f. Study the night sky. Sketch the appearance of the North Star and the Big Dipper over at least six hours. g. With adult assistance, explore safe chemical reactions with household materials. h. Explore properties of motion on a playground. How does the weight of a person affect how fast they slide down a slide or how fast a swing moves? i. Read a biography of a scientist. Tell your den or family what the scientist is famous for and why his or her work is important.	**At Home** **Den Meeting**	

Ways to notify unit/den leadership of completion of activities in the HomeScouting Adventure Club:

- Enter date of requirement completions in Scoutbook
- Turning in the tracking tool above to your leadership
- Fill out the monthly reporting tool at www.homescouting.org/hacreporting and a report will be sent to your leader on your behalf

Check with your unit leadership to find out the best method to report completions!

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WORKSHEET

All HomeScouting worksheets are for your use only and will not be turned in. Use them to help guide you through the adventure.

Requirement 1: An experiment is a "fair test" to compare possible explanations. Draw a picture of a fair test that shows what you need to do to test a fertilizer's effects on plant growth.

Draw a picture of your own fair test to compare fertilizers.

Make a prediction about how the fertilizer will influence the way the plant grows.

_____

_____

_____

ADVENTURES IN SCIENCE WORKSHEET

Requirement 2: Visit a museum, a college, a laboratory, an observatory, a zoo, an aquarium, or other facility that employs scientists. Prepare three questions ahead of time, and talk to a scientist about his or her work.

Question #1:

_____

_____

Question #2:

_____

_____

Question #3:

_____

_____

Requirement 3: Complete any four of the following experiments. The next pages are connected worksheets for each experiment. You do not have to do all of the experiments.

- ❑ Carry out the experiment you designed for Requirement 1.
- ❑ If you completed 3A, carry out the experiment again but change the independent variable.
- ❑ Build a model solar system. Chart the distances between the planets so that the model is to scale.
- ❑ With adult supervision, build and launch a model rocket.
- ❑ Create two circuits of three light bulbs and a battery. Construct one as a series circuit and the other as a parallel circuit.
- ❑ Study the night sky. Sketch the appearance of the North Star and the Big Dipper over at least six hours.
- ❑ With adult assistance, explore safe chemical reactions with household materials.
- ❑ Explore properties of motion on a playground. How does the weight of a person affect how fast they slide down a slide or how fast a swing moves?
- ❑ Read a biography of a scientist. Tell your den or family what the scientist is famous for and why his or her work is important.

ADVENTURES IN SCIENCE WORKSHEET

Requirement 3a: Carry out the experiment you designed for Req. 1.

Make a prediction about how the plants will grow.

_____

_____

_____

Describe how the plants actually grew.

_____

_____

_____

Did your prediction match your observation? Yes No

Use the space below to draw a picture of what happened.

ADVENTURES IN SCIENCE WORKSHEET

Requirement 3b: If you completed 3a, carry out the experiment again but change the independent variable.

	Independent Variable			
	Amount 1 = _____	Amount 2 = _____	Amount 3 = _____	
Day	Plant Height	Plant Height	Plant Height	Notes
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				
Day 8				
Day 9				
Day 10				
Day 11				
Day 12				
Day 13				
Day 14				
Day 15				
Day 16				
Day 17				
Day 18				
Day 19				
Day 20				
Day 21				
Day 22				
Day 23				
Day 24				
Day 25				
Day 26				
Day 27				

ADVENTURES IN SCIENCE WORKSHEET

Requirement 3c: Build a model solar system. Chart the distances between the planets so that the model is to scale.

In your backyard build a scale model of the solar system using basketballs, baseballs, soccer balls, etc. Challenge your family members to see who can race from planet to planet in the fastest time.

This chart shows each planet's approximate distance from the sun, along with scale distances. It also shows Proxima Centauri, the nearest star to the sun.

Object	Approximate Distance to Sun (miles)	Scale Distance (in inches) 1 million miles = 1 in	Scale Distance (in feet)	Scale Distance (in centimeters) 1 million miles = 1 cm	Scale Distance (in meters)
Sun	-	-	-	-	-
Mercury	36,000,000	36	3.0	36	0.36
Venus	67,000,000	67	5.6	67	0.67
Earth	93,000,000	93	7.8	93	0.93
Mars	141,500,000	141.5	11.8	141.5	1.42
Jupiter	483,300,000	483.3	40.3	483.3	4.83
Saturn	886,200,000	886.2	73.9	886.2	8.86
Uranus	1,789,900,000	1789.9	149.2	1789.9	17.90
Neptune	2,792,600,000	2792.6	232.7	2792.6	27.93
Proxima Centauri	25,200,000,000,000	25200000	2,100,000.0	25,200,000	252000.00

What is the value of making a model in science? How could making a model this big be useful?

_____

_____

_____

_____

_____

ADVENTURES IN SCIENCE WORKSHEET

Requirement 3d: With adult supervision, build and launch a model rocket. Use the rocket to design a fair test to answer a question about force or motion.

Your Fair Test Design about Force or Motion

Your question about force or motion =

_____

_____

_____

How does your rocket launch answer this question?

_____

_____

_____

_____

_____

_____

Requirement 3e: Create two circuits of three light bulbs and a battery. Construct one as a series circuit and the other as a parallel circuit.

ADVENTURES IN SCIENCE WORKSHEET

Requirement 3f: Study the night sky. Sketch the appearance of the North Star (Polaris) and the Big Dipper (part of the Ursa Major constellation) over at least six hours ***(which may be spread over several nights***). Describe what you observed, and explain the meaning of your observations.

Sailors and travelers have used the stars for hundreds of years to find their way. One of these stars is called the North Star. It is located almost directly above the North Pole. The North Star is a dim star and not very bright, but it is an important star to pick out.

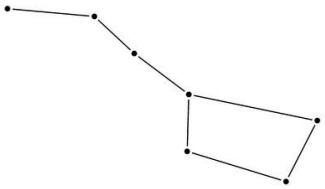
To find this star, first look for the group of stars called the Little Dipper. The Little Dipper looks like a spoon with a long handle. The North Star is located at the end of the handle of the little dipper.

Draw the North Star, the Big Dipper, and the Little Dipper in the night sky over six hours.

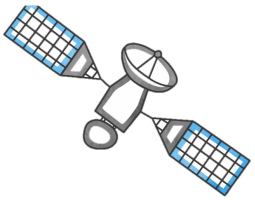
ADVENTURES IN SCIENCE WORKSHEET

What else did you see in the night sky?

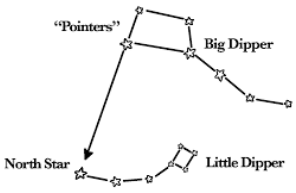
The Big Dipper



Satellite



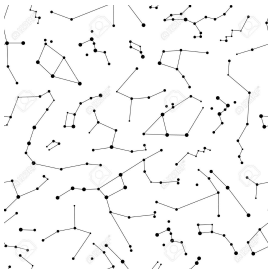
The North Star



A planet

Airplane

A constellation



Did you find anything else not listed above?

_____

_____

_____

ADVENTURES IN SCIENCE WORKSHEET

Requirement 3g: With adult assistance, explore safe chemical reactions with household materials. Using two substances, observe what happens when the amounts of the reactants are increased.

MEASURING THE GAS PRODUCTION

What happened as you poured the vinegar into the baking soda?

_____

_____

What happens when you change the amount of baking soda?

_____

_____

What happens when you change the amount of vinegar?

_____

_____

Requirement 3h: Explore properties of motion on a playground. How does the weight of a person affect how fast they slide down a slide or how fast a swing moves? Design a fair test to answer one of those questions.

Use the next page for your observations.

ADVENTURES IN SCIENCE WORKSHEET

SLIDE INVESTIGATION

Name of Person Sliding	Weight of Person Sliding	Time #1	Time #2	Time #3	Average Time (Time 1 + Time 2 + Time 3 / 3)

SWING INVESTIGATION

Name of Person Swinging	Weight of Person Sliding	Time #1	Time #2	Time #3	Average Time (Time 1 + Time 2 + Time 3 / 3)

ADVENTURES IN SCIENCE WORKSHEET

Requirement 3i: Read a biography of a scientist. Use the space below to take notes.

My Scientist = _____