

Scientific Method



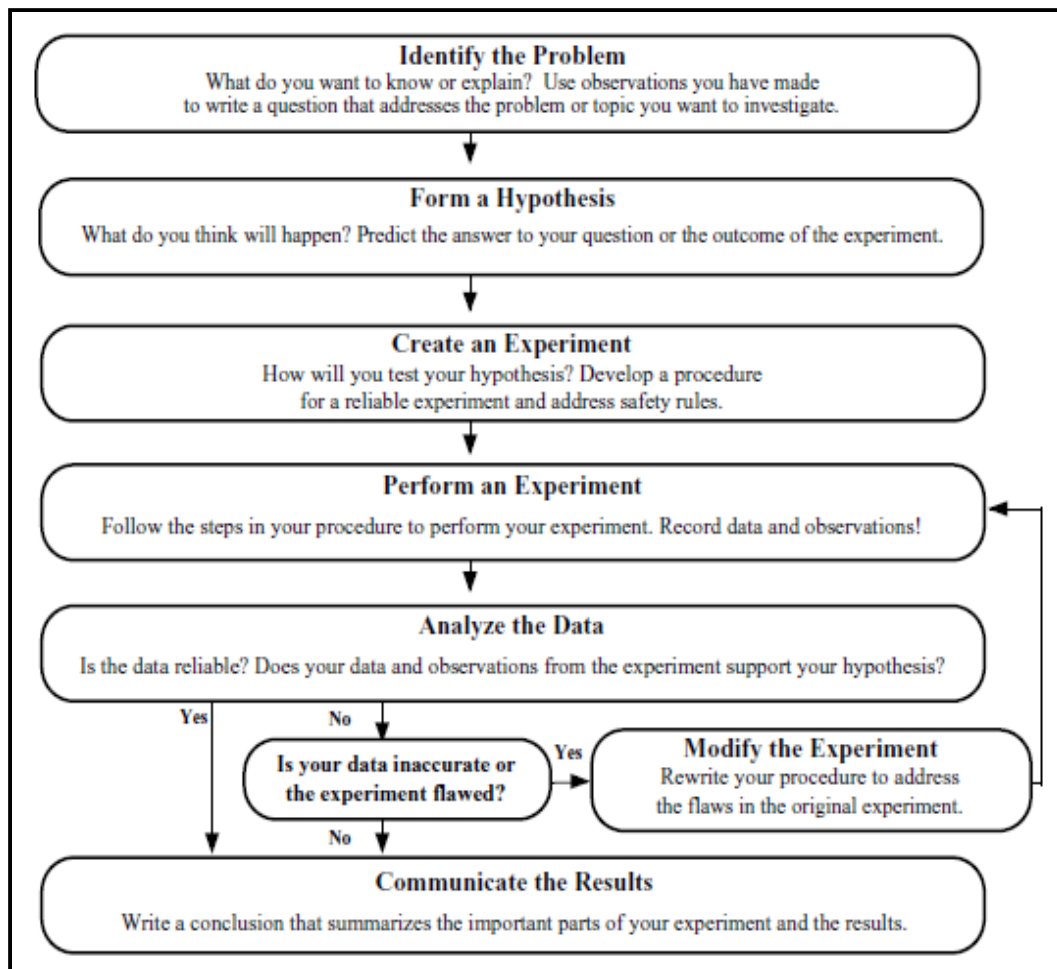
2009 K8 Update
Western Illinois University

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Scientific Method

Although there are many version of the “method”, all of them progress from observations and identifying a problem through testing and analysis.



Note & Review Worksheets

Scientific Method Name _____

What is the scientific method? It is a _____ that is used to find _____ to questions about the world around us.

Is there only one "scientific method"? No, there are several versions of the scientific method. Some versions have more _____ while others may have only a few. However, they all begin with the identification of a _____, is to be answered based on observations of the world around us and provide an _____ method for conducting and analyzing an experiment.

What is a hypothesis? It is an _____ based on observations and your knowledge of the topic.

What is data? It is _____ gathered during an experiment.

What do you want to know or explain? Use observations you have made to write a question that addresses the problem or topic you want to investigate:

What do you think will happen? Predict the answer to your question or the outcome of the experiment:

How will you test your hypothesis? Develop a procedure for a reliable experiment and address safety rules:

Follow the steps in your procedure to perform your experiment. Record data and observations:

Is the data reliable? Does your data and observations from the experiment support your hypothesis?

Yes _____ No _____

Is your data inaccurate or the experiment flawed? Yes _____ No _____

Rewrite your procedure to address the flaws in the original experiment:

Write a conclusion that summarizes the important parts of your experiment and the results:

T. Trampe 2003 <http://sciencspot.net/>

Scientific Method Review Name _____

Use the clues to help you fill in the puzzle.

Clues:


- The _____ is the part of an experiment that is not being tested and is used for comparison.
- The _____ describes the steps you use during an experiment.
- After an experiment, scientists write a _____, which summarizes their experiment and results.
- The _____ is a process used by scientists to find answers to questions or solve a problem.
- The _____ variable is the part of the experiment that is being tested or the part that is changed by the person doing the experiment.
- The _____ is an educated guess.
- Scientists use their data to make charts and _____, to communicate the results of an experiment.
- After the scientist makes a hypothesis, they perform an _____, to collect data.
- The first step of the scientific method is to define or identify the _____.
- Sometimes scientists make a mistake, or _____, and need to do an experiment again.
- The _____ variable is the part of the experiment that is affected by the independent variable.
- After the experiment, scientists organize and _____ the data.
- The information collected during an experiment is called _____.
- Scientists make _____, to help them make a hypothesis or collect data during an experiment.

T. Trampe 2003 <http://sciencspot.net/>

All the materials are available on the **General Science** page of the **Science Classroom** area of my website at <http://sciencspot.net/Pages/classgen.html>

Scientific Method – Variables & Reliability

Drops on a Penny Lab – Students conduct tests to see how many drops of water can fit onto a penny.

 **How many drops of H₂O can fit on a penny?** Name _____

Take a Guess: How many drops of water can fit on one side of a penny? _____

Part A: Perform a CONTROL test for comparison with later results.
Step 1: Rinse a penny in tap water and dry completely.
Step 2: Place the penny on paper towel.
Step 3: Use an eye dropper to place drops of WATER on the penny (one at a time) until ANY amount of water runs over the edge of the penny.
Step 4: Record the number of drops for that trial in the table.

Repeat Steps 1 - 4 three more times before calculating your average.

Trial 1	Trial 2	Trial 3	Trial 4	Average

Part B: Perform tests with the TESTING LIQUID.
Step 1: Start with a "clean" penny. Rinse the penny in tap water and dry completely. Be sure to remove as much residue as possible - without using soap!
Step 2: Hold the penny with the tweezers provided, then dip it into the TESTING LIQUID. Allow extra liquid to drip off the penny into the container before proceeding to the next step.
Step 3: Place penny on dry spot on a paper towel. Place drops of WATER on the penny (one at a time) until ANY amount of water runs over the edge of the penny.
Step 4: Record your observations and the number of drops for that trial in the table.
Repeat Steps 1 - 4 three more times before calculating the average.

Trial 1	Trial 2	Trial 3	Trial 4	Average

Part C: Answer each question related to the experiment.

1. Explain your results from both parts of the experiment in terms of cohesion and surface tension.

2. How do your results compare to the other groups in your class? Provide at least 2 possible reasons for any similarities and differences you identified.

T. Trimpe 1999 <http://sciencespot.net/>

Discussion Questions:

1 – What variables were involved?

- ▶ Size of drops
- ▶ Soap vs. No Soap
- ▶ Heads vs. Tails
- ▶ New Penny vs. Old Penny



2 – What was the control group?

3 – What were the independent and dependent variables?

4 - Were your results reliable?

- ▶ Did everyone have the same results?
- ▶ Did everyone have the same size drops?
- ▶ Did anyone miss count?

3 – How could we make sure our results are reliable?

4 - What other tests could we do?

Download includes student worksheets, answer key, and background information.

Scientific Method – SpongeBob Lessons

These lessons provide students with the opportunity to apply what they have learned from the lesson notes and penny lab to investigate controls, independent variable, dependent variables, and reliability.



Scientific Method
Bikini Bottom Experiments

Name _____

The Bikini Bottom gang loves science class and wanted to do a little research. Read the description for each experiment and use your knowledge of the scientific method to answer the questions.

(1) Flower Power
SpongeBob loves to garden and wants to grow lots of pink flowers for his pal Sandy. He bought a special Flower Power fertilizer to see if will help plants produce more flowers. He plants two plants of the same size in separate containers with the same amount of potting soil. He places one plant in a sunny window and waters it every day with fertilized water. He places the other plant on a shelf in a closet and waters it with plain water every other day.

What did SpongeBob do wrong in this experiment? Explain.

What should SpongeBob do to test the effectiveness of Flower Power fertilizer? Write an experiment.

(2) Super Snails
Gary is not the smartest snail in Bikini Bottom and believes he can improve his brain power by eating Super Snail Snacks. In order to test this hypothesis, he recruits SpongeBob and several snail friends to help him with the experiment. The snails ate one snack with each meal every day for three weeks. SpongeBob created a test and gave it to the snails before they started eating the snacks as well as after three weeks.

Based on the data provided, do the Super Snail Snacks work? Explain your answer.

Test Results		
Snail	Before	After
Olaf	48%	80%
Larry	78%	78%
Gary	62%	84%
Patty	72%	90%

Bikini Bottom Experiments

Students analyze experiments to determine if they were done correctly and/or if the results are reliable. They are also challenged to write their own experiments using their knowledge of the scientific method.

Scientific Method
Controls and Variables – Part 1

Name _____

SpongeBob and his Bikini Bottom pals have been busy doing a little research. Read the description for each experiment and answer the questions.

1 - Patty Power
Mr. Krabs wants to make Bikini Bottoms a nicer place to live. He thinks will reduce the production of body gas associated with eating Krab. He recruits 100 customers with a history of gas problems. 50 crabby patties with the new sauce. The other 50 (Group B) eat crabby like new sauce but is really just mixture of mayonnaise and food coloring they were getting the sauce that would reduce gas production. The patties, 30 customers in group A reported having fewer gas problems.

Which people are in the control group?
What is the independent variable?
What is the dependent variable?
What should Mr. Krabs' conclusion be?

Why do you think 8 people in group B reported feeling better?

2 – Slimotosis
Sponge Bob notices that his pal Gary is suffering from slimotosis develops a nasty slime and gives off a horrible odor. His friend Patrick on the shell is the perfect cure, while Sandy says that drinking Dr. Bob decides to test this cure by rubbing Gary with seaweed for 1 week. After a week of treatment, the slime is gone and Gary's shell smells better.

What was the initial observation?
What is the independent variable?
What is the dependent variable?
What should Sponge Bob's conclusion be?

Worksheet created by T. Trimpe 2003 <http://www.teacherspayteachers.com>

Controls & Variables I & II

These two lessons challenge students to analyze experiments conducted by SpongeBob and his pals to identify controls and variables as well as analyze data.

Scientific Method
Controls and Variables – Part 2

Name _____

SpongeBob and his Bikini Bottom pals have continued doing a little research to solve some problems. Read the description for each experiment and answer the questions.

Krusty Krabs Breath Mints
Mr. Krabs created a secret ingredient for a breath mint that he thinks will "cure" the bad breath people get from eating crabby patties at the Krusty Krab. He asked 100 customers with a history of bad breath to try his new breath mint. He had fifty customers (Group A) eat a breath mint after they finished eating a crabby patty. The other fifty (Group B) also received a breath mint after they finished the sandwich, however, it was just a regular breath mint and did not have the secret ingredient. Both groups were told that they were getting the breath mint that would cure their bad breath. Two hours after eating the crabby patties, thirty customers in Group A and ten customers in Group B reported having better breath than they normally had after eating crabby patties.

- Which people are in the control group?
- What is the independent variable?
- What is the dependent variable?
- What should Mr. Krabs' conclusion be?
- Why do you think 10 people in group B reported fresher breath?

SpongeBob Clean Pants
SpongeBob noticed that his favorite pants were not as clean as they used to be. His friend Sandy told him that he should try using Clean-O detergent, a new brand of laundry soap she found at Sail-Mart. SpongeBob made sure to wash one pair of pants in plain water and another pair in water with the Clean-O detergent. After washing both pairs of pants a total of three times, the pants washed in the Clean-O detergent did not appear to be any cleaner than the pants washed in plain water.

- What was the problem SpongeBob wanted to investigate?
- What is the independent variable?
- What is the dependent variable?
- What should Sponge Bob's conclusion be?

Independent Investigations

At the end of my scientific method unit, I challenge my students to create an experiment of their own involving bouncy balls.

Independent Investigation Guidelines

Step 1: Create a Question

- What do you want to find out?
- Does your question relate to the topic?
- Can you develop an experiment to answer your question?
- Does your question make sense? Is it confusing?

Step 2: Hypothesis

- What do you think will happen?
- BE SPECIFIC!
- Use complete sentences.

Step 3: Procedure

- What steps will you follow to find an answer?
 - ✓ BE SPECIFIC! Label your steps using 1, 2, 3, etc.
 - ✓ Would someone else be able to follow your directions?
- How will you collect your data?
- How will you ensure reliable results?
- What safety issues need to be addressed?

Step 4: Experiment & Data

- Be sure to display your data in an organized manner. Use a table or chart to help you show your results. Don't forget to label!
- Include enough data to prove or disprove your hypothesis.

Step 5: Analysis/Conclusion

- What happened during your experiment?
- Did your results support your hypothesis?
- Write a summary of what you learned during your experiment and address your results.
- Explain any unexpected results.
- Are your results reliable?
- Did you use complete sentences?

Name _____

Question
What do you want to find out?

Hypothesis
What do you think will happen?

Procedure
Design your experiment! Write the steps for your experiment.

Data
Create a table, chart, or graph to record your data.

Conclusion/Analysis
What did you find out? Did your results support your hypothesis? Are your results reliable?

Safety Rules
What safety rules do you need to follow during your experiment?

I always emphasize the need for safety! Each group must have my permission before attempting any part of the experiment. If a group has not addressed possible errors or safety rules, I have them rewrite the lab until it meets with my approval.

Consumer's Challenge – Students test an advertising claim using the scientific method discussed in class. The download includes student worksheets, grade rubric, and group rating slips for the kids to rate their fellow students.

Old Wives' Tales – Each group chooses a tale to test using the scientific method. Each group works together as a class to find out if the tale is true or false and prepare a written report.



Consumer's Challenge
MAKE A PLAN

Name(s): _____

Part A: Think About It!
(1) What product(s) will you test?

(2) What do you want to find out? Write a question that addresses the goal of your experiment.

(3) What do you think will happen?

Part B: Plan It!
(4) What will you do to ensure reliable results?

(5) What safety issues do you need to address?

(6) What steps will you use in your experiment? Be specific!

Old Wives' Tale or Helpful Hint?

People often tell us things and ask us to believe they're true. Some of these "Helpful Hints" are true. Some aren't. People have realized for a long time that some of these hints aren't true and call them "Old Wives' Tales." An Old Wives' Tale is an everyday statement that some people believe is true, but it really isn't. But how can you tell them apart? You can't just ask a grownup, some of them are wrong. The only way anyone knows the truth for sure is to use the Scientific Method.

Each group will choose a hint/old wives' tale to test using the scientific method. Make sure you choose an old wives' tale or hint, not a superstition. A superstition involves luck, magic or the supernatural, a hint or old wives' tale does not. Each group will work together as a class to find out if this hint is true or false. Each group is responsible for preparing an individual written lab report. Your grade on this assignment will be based on your participation during the project in and out of class and your written and oral lab reports.

Homework to prepare for Day 1:
Explain to at least two adults the difference between a helpful hint, a superstition and an old wives' tale. Ask the adults to help you come up with as many examples as you can. You must write down and bring in at least 10 examples tomorrow.

Day 1 - Determine your PURPOSE
Each student should bring in at least ten old wives' tales or helpful hints to class. We'll list all the old wives' tales on the board. Your group should choose the one you plan to test on your project sheet. It must be a question that you can test quickly and SAFELY. Your teacher must check your PURPOSE before you continue.

Day 2 - RESEARCH:
We'll spend one day researching in the library. Summarize what you learned on your group's project sheet

Day 3 - HYPOTHESIS & EXPERIMENT
Use what you've learned to write a testable hypothesis. Design an experiment to test your hypothesis. Write the procedure you plan to use as well as a materials list. Make sure you control for any variables. Do not begin your test until your teacher has approved your research, hypothesis, material and procedure and signed your project sheet.


S. Bynum 2001

Paper Airplanes

Come Fly With Me – Students test paper airplanes. Version 1 (left) is the basic version and provides detailed instructions for the students. Version 2 (right) is the advance version that challenges students to develop their own procedure for the experiment.

NAME _____ DATE _____

Come Fly with Me Lab



QUESTION - How does the weight of paper affect how far a paper airplane will fly?


HYPOTHESIS _____

MATERIALS
3 papers of different weights (notebook, computer, construction, newspaper, cardstock, etc.)
Measuring tape

PROCEDURES
Design the procedures with your partner. Number your procedures. This can be completed on the back of this paper.

DATA CHART
You will need to design a chart to organize the data you collect. Your chart needs to include 3 trials and an average for each type of paper. You will also have to make a bar graph of your averages. This can be completed on the back of this paper.

CONCLUSION
Your lab group will have to write a conclusion. Remember that your conclusion should explain your results and how they relate to your question. This can be completed on the back of this paper.




Jessi Bergman

Version 1

NAME _____ DATE _____

Come Fly with Me Lab



QUESTION - How does the weight of paper affect how far a paper airplane will fly?

HYPOTHESIS _____

MATERIALS
3 papers of different weights (notebook, computer, construction, newspaper, cardstock, etc.)
Measuring tape

PROCEDURES
1. Select three different types of paper and cut them so they are all the same size.
2. Fold the papers into airplanes. Make sure they are all folded the same way.
3. Launch each airplane three different times. The same person should launch the airplane each time to ensure the same force is used for all trials.
4. Using the data chart, record the distance the airplane traveled to the nearest centimeter.

DATA CHART

Write in the paper type below	Trial 1	Trial 2	Trial 3	Average

GRAPH
Using the averages create a bar graph on graph paper and staple to the back of this sheet.


Jessi Bergman

Version 2

Mythbusters

Use episodes from the Mythbusters series to explore the use of the scientific method in a real-world setting.

The screenshot shows the Discovery Education website interface. At the top, there's a navigation bar with 'Products & Services', 'School Resources', 'Educator Network', 'Store', and 'About Us'. Below this is a search bar and a 'GO' button. The main content area is titled 'Teacher Feature: MythBusters: Scientific Inquiry'. It features a header image with the MythBusters logo and the text 'SCIENTIFIC INQUIRY'. Below the header, there's a paragraph explaining that the MythBusters use the scientific method to prove or disprove common beliefs about physical science. The page is organized into four columns: Resources, Activities, Video Clips, and Store. Each column contains several items with brief descriptions and links to view lesson plans, images, or videos. For example, under Resources, there are lesson plans for Grades 3-5, 6-8, and 9-12. Under Activities, there's 'Science as Inquiry' and a 'Puzzle'. Under Video Clips, there are clips about 'Who Was the Iceman?', 'Volcanology: The Science of Predicting Volcanoes', 'Memory as a Biological Process', and 'The Golden Age of Astronomy'. Under Store, there's a 'MythBusters' item with a 'More Info' link.

 Name _____
Episode Title: _____

1. What warnings do they give to viewers at the beginning of the show?
2. What myth or legend are they investigating? Pick one if there are more than one in the clip you are viewing.
3. What did they know before they began investigating?
4. What did they do to investigate the myth/legend? (Use another sheet of paper if needed)
5. What did they learn from their investigation - confirmed or busted? Why?
6. Identify any controls and variables involved in the investigation.
7. Identify the safety measures they used to prevent accidents and/or injuries.
8. Are their results reliable? Explain.

T. Trimpe 2008 <http://sciencespot.net/>

Problem-Based Learning Unit

Butterfly Brigade

Problem Statement: The local board of the US Fish and Wildlife Service wants to increase the biodiversity of the butterfly populations within Chautauqua Wildlife Refuge. Your task, as refuge biologist, is to recommend a strategy to increase the diversity of the butterfly populations at this site.

This unit and related resources is available on my website. Go to the [Science Classroom](#) and then click the icon for Adopt-An-Insect to find the webpage.



Student Activities

Pre- & Post-Tests – Students take tests before and after the unit to allow us to evaluate their learning during the unit.

Math ID#

1. The price of gasoline in a certain region rose from \$1.20 to \$1.77 and then to \$1.95 per gallon. What is the median price per gallon for gasoline in the region?

A) \$1.41
B) \$1.52
C) \$1.64
D) \$1.67
E) \$1.87

2. The pie chart shows the portion of time Pat spent on homework in each subject last week. If Pat spent 2 hours on mathematics, about how many hours did Pat spend on homework altogether?

A) 4
B) 5
C) 12
D) 14
E) 28

3. What is the median of the numbers shown?

A) 1
B) 4
C) 7
D) 7
E) 8

4. According to the graph, how many times did the weekly income of the price of a hamburger exceed \$1.00?

A) None
B) One
C) Two
D) Three
E) None

5. Given a diver's course from a recent competition are represented in the row-and-column below, in the place of x would be best?

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

6. It is important to accurately report the results from an experiment. To do this, you must do all of the following:

A) You must include all the results of the experiment in your report.
B) You must include all the results of the experiment in your report.
C) You must include all the results of the experiment in your report.
D) You must include all the results of the experiment in your report.

7. A student wants to perform an experiment to test how much water bean plants need for good growth. Which factor should be changed?

A) The temperature
B) The amount of light
C) The amount of soil
D) The amount of water

8. Two groups of mice were put in each of two cages. One of the cages had 100 mice and the other had 50 mice. Which would be the best scientific evidence to decide which cage was better?

A) The best place in the world for each cage.
B) The number of mice in each cage.
C) The number of mice in each cage.
D) The number of mice in each cage.

Butterfly Boot Camp – Students learn how to identify butterflies in our area.

Butterfly Brigade
BUTTERFLY BOOT CAMP
Brushfooted Part #1 (Family Nymphalidae)
Presentation created by Tracy Trampe
The Science Spot - <http://sciencepot.net/>
Images from <http://www.bfly.org/gallery.html> unless otherwise noted.

American Lady
Top – Inner mark orange
Bottom – Large eyespots

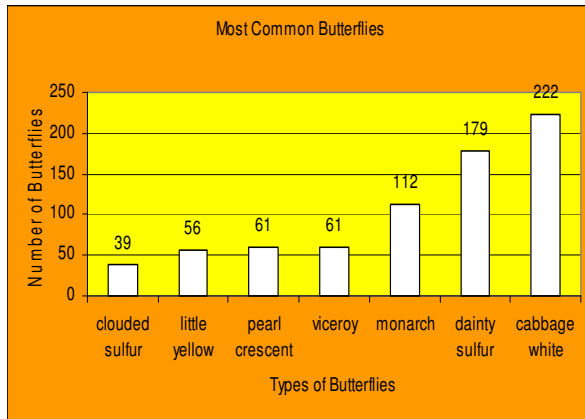
Regal Fritillary
Endangered butterfly in Illinois
Similar to great-spangled, but with more white on undersides and white on top hindwings

Identify each butterfly.

A) American Lady
B) Painted Lady
C) Pearl Crescent
D) Regal Fritillary
E) Great-spangled Fritillary
F) Buckeye

Scientific Investigations – Students work together to develop a survey method that will ensure reliable, accurate data.

Butterfly Survey – Students visit Chautauqua Refuge to meet the refuge staff and complete a butterfly survey.



Data Analysis – Students use Excel to create spreadsheets and graphs to help them analyze their data and identify areas of concern.

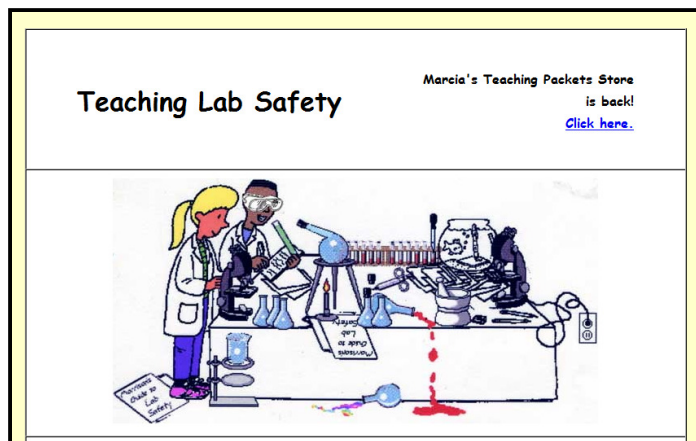
Final Reports – Students develop a PowerPoint presentation for the refuge manager that summarizes the collected data, outlines their areas of concern, and recommends strategies to increase butterfly species diversity.



Safety Rules

Science Safety Rules

Students read the story and identify 18 incidents in which the safety rules were not followed.



Visit the Science Teaching Ideas website at <http://mjksiteachingideas.com/safety.html> for several great ideas for teaching lab safety!

Scientific Method
Science Safety Rules

Name _____

The Bikini Bottom gang has been learning safety rules during science class. Read the paragraphs below to find the broken safety rules and underline each one. How many can you find?

SpongeBob, Patrick, and Gary were thrilled when Mr. Krabbs gave their teacher a chemistry set! Mr. Krabbs warned them to be careful and reminded them to follow the safety rules they had learned in science class. The teacher passed out the materials and provided each person with an experiment book.

SpongeBob and Gary flipped through the book and decided to test the properties of a mystery substance. Since the teacher did not tell them to wear the safety goggles, they left them on the table. SpongeBob lit the Bunsen burner and then reached across the flame to get a test tube from Gary. In the process, he knocked over a bottle of the mystery substance and a little bit splashed on Gary. SpongeBob poured some of the substance into a test tube and began to heat it. When it started to bubble he looked into the test tube to see what was happening and pointed it towards Gary so he could see. Gary thought it smelled weird so he took a deep whiff of it. He didn't think it smelled poisonous and tasted a little bit of the substance. They were worried about running out of time, so they left the test tube and materials on the table and moved to a different station to try another experiment.

Patrick didn't want to waste any time reading the directions, so he put on some safety goggles and picked a couple different substances. He tested them with vinegar (a weak acid) to see what would happen even though he didn't have permission to experiment on his own. He noticed that one of the substances did not do anything, but the other one fizzed. He also mixed two substances together to see what would happen, but didn't notice anything. He saw SpongeBob and Gary heating something in a test tube and decided to do that test. He ran over to that station and knocked over a couple bottles that SpongeBob had left open. After cleaning up the spills, he read the directions and found the materials he needed. The only test tube he could find had a small crack in it, but he decided to use it anyway. He lit the Bunsen burner and used tongs to hold the test tube over the flame. He forgot to move his notebook away from the flame and almost caught it on fire.

Before they could do another experiment, the bell rang and they rushed to put everything away. Since they didn't have much time, Patrick didn't clean out his test tube before putting it in the cabinet. SpongeBob noticed that he had a small cut on his finger, but decided he didn't have time to tell the teacher about it. Since they were late, they skipped washing their hands and hurried to the next class.

Science Starters

Several **Science Starters** are available for use with the Scientific Method unit.



Google™ Custom Search

General Science

Science A to Z - These starters challenge students to unscramble the letters and use the clues to provided to identify science terms.

Topics: [A](#), [B](#), [C](#), [D](#), [E](#), [F](#), [G](#), [H](#), [I](#), [J-K](#), [L](#), [M](#), [N](#), [O](#), [P](#), [Q](#), [R](#), [S](#), [T](#), [U-W](#), [X-Z](#)
Other Scrambles: [Year of Science](#) (This is the first starter I do each year.)

Name the Ologist - These starters relate to the various types of scientists and are used during the [Super Scientists](#) unit.

Sets: [Set 1](#), [Set 2](#), [Set 3](#), [Set 4](#), [Set 5](#)

Science Equipment - For the first two starters, students are challenged to identify common lab equipment. The other starters involve identifying the parts of a microscope, questions about the functions of microscope parts, powers of magnification, and pond water samples.

Sets: [Set 1](#), [Set 2](#), [Microscopes1 \(Parts\)](#), [Microscopes 2 \(Parts\)](#), [Microscopes 3 \(Questions\)](#), [Microscopes 4 \(Questions\)](#), [Microscopes 5 \(Questions\)](#), [Microscopes 6 \(Powers\)](#), [Pond Water Organisms](#)

Science Safety - These challenge review important safety rules. The first two starters give students a picture to analyze for safety concerns, while the third is a word scramble challenge with safety phrases.

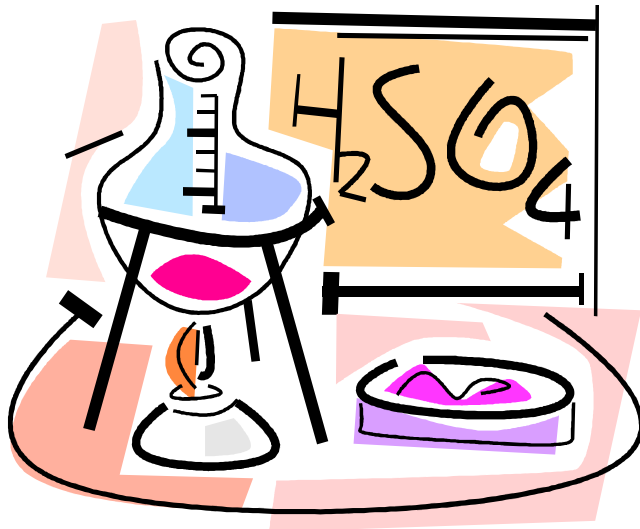
Sets: [Safety Picture 1](#), [Safety Picture 2](#), [Safety Scramble](#)

Science Experiments - These challenges review the scientific method. For challenges 1 & 2, students answer questions related to controls and variables about an experiment.

Sets: [Experiment Scramble](#), [Experiment 1](#), [Experiment 2](#)

Science Starters Main Page: <http://sciencespot.net/Pages/starters.html>

What's Wrong?



Lab Safety Challenge #1

What's wrong? Identify 6 different safety concerns shown in the picture below.

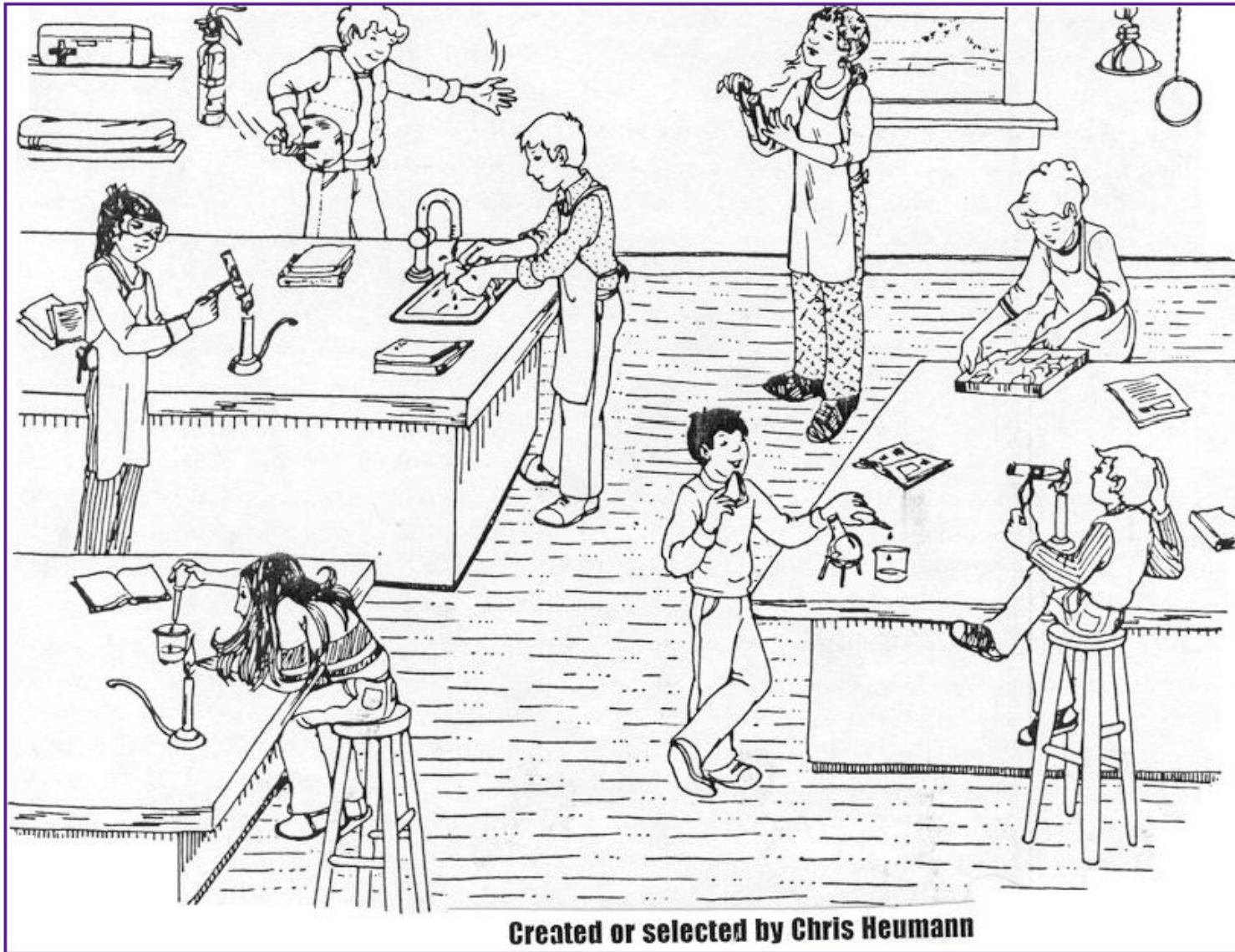
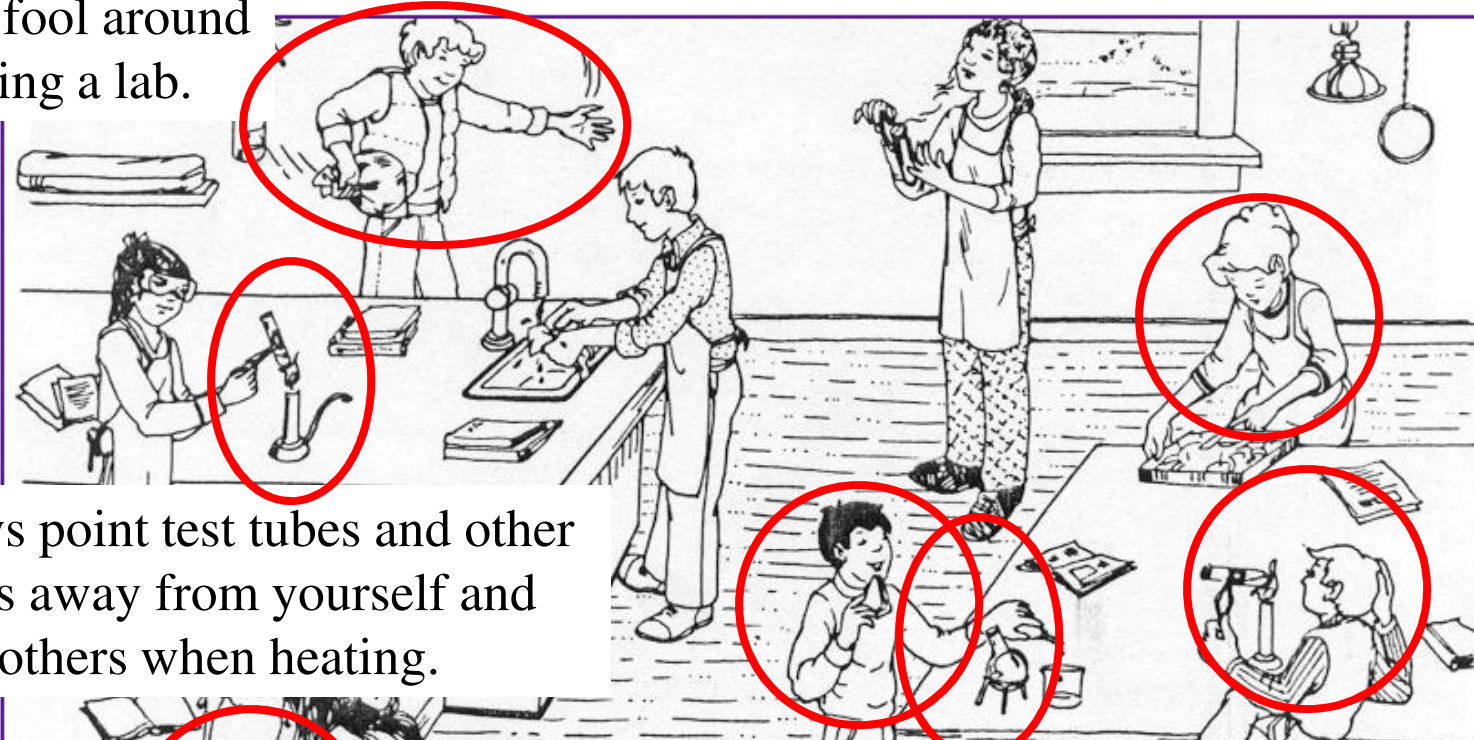


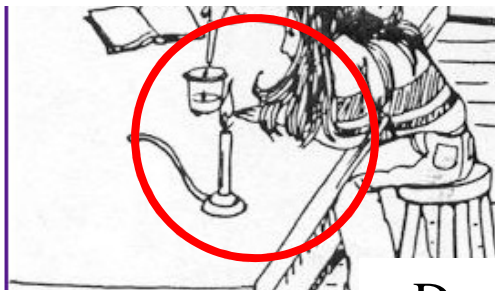
Image: http://morrisonlabs.com/lab_safety.htm

The answers are ...

Don't fool around during a lab.



Always point test tubes and other items away from yourself and others when heating.



Don't eat or drink while in the lab.

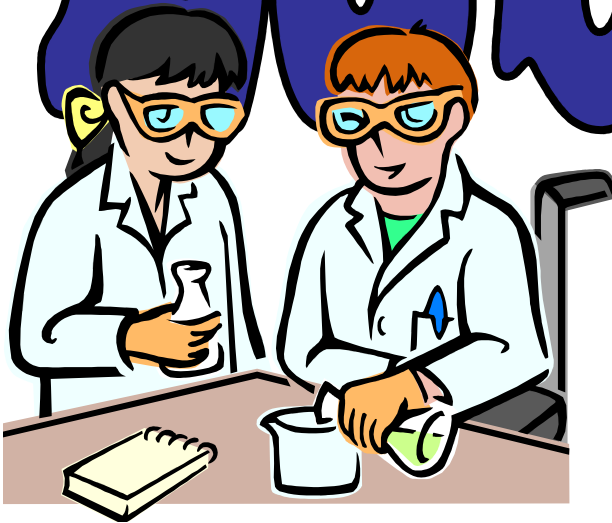
Always wear safety goggles when doing an experiment

Keep hair and other flammable objects away from flames.

Don't leave a flame unattended.

Created or selected by Chris Heumann

Lab Time



Science Experiments #1

Read the information below and then answer the questions.

SpongeBob and Patrick love to go jellyfishing. They wondered if a new brand of jellyfish bait would help them catch more jellyfish. To test their idea, they bought a big container of bait for their next 3 trips to their top-secret fishing spot. SpongeBob fished without any bait, while Patrick used the new bait. Both of them kept track of how many jellyfish they caught in 30 minutes, which is shown in the chart.

SpongeBob	Patrick
25	24
18	28
26	19

1. Which person was the control?
2. What is the independent variable?
3. What is the dependent variable?
4. Based on the data, how would you rate the new bait?



Read the information below and then answer the questions.

SpongeBob and Patrick love to go jellyfishing. They wondered if a new brand of jellyfish bait would help them catch more jellyfish. To test their idea, they bought a big container of bait for their next 3 trips to their top-secret fishing spot. SpongeBob fished without any bait, while Patrick used the new bait. Both of them kept track of how many jellyfish they caught in 30 minutes, which is shown in the chart.

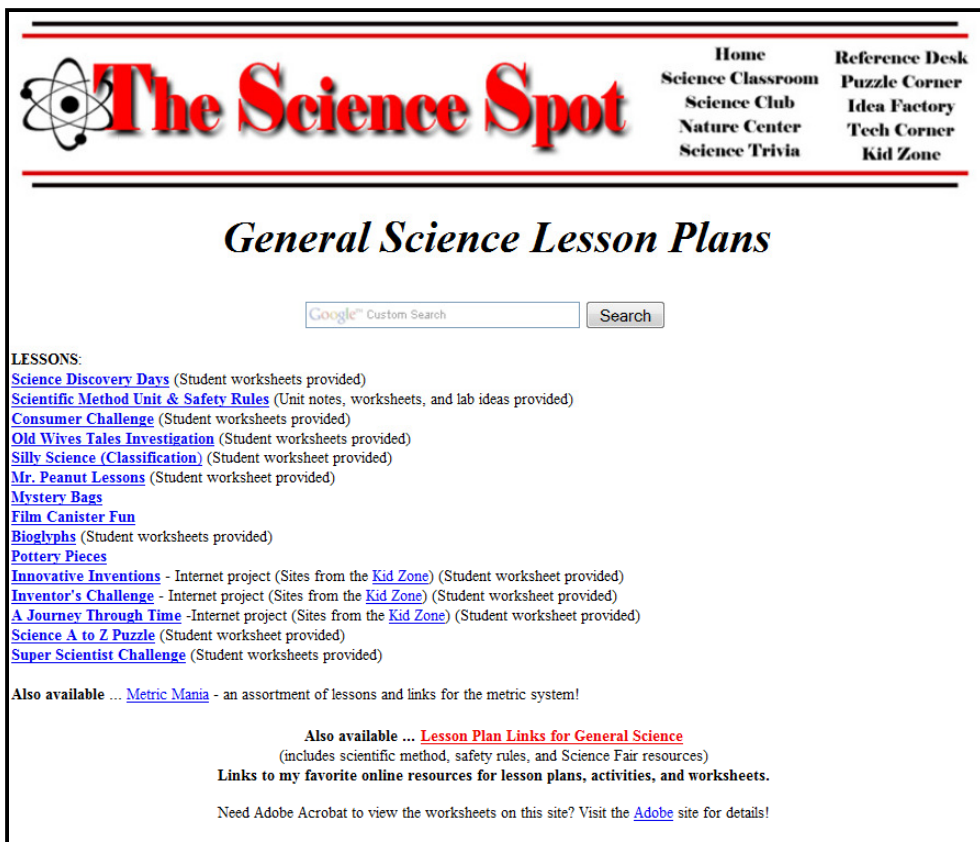
SpongeBob	Patrick
25	24
18	28
26	19

1. Which person was the control? **SpongeBob**
2. What is the independent variable? **Jellyfish Bait**
3. What is the dependent variable? **Number of jellyfish caught**
4. Based on the data, how would you rate the new bait?

The bait appears to have helped a small amount, but shouldn't be rated as a great deal. Overall Patrick caught 2 more jellyfish than SpongeBob.

Online Resources

Visit the **General Science** area of the **Science Classroom** for other great lessons.



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LESSONS:

- [Science Discovery Days](#) (Student worksheets provided)
- [Scientific Method Unit & Safety Rules](#) (Unit notes, worksheets, and lab ideas provided)
- [Consumer Challenge](#) (Student worksheets provided)
- [Old Wives Tales Investigation](#) (Student worksheets provided)
- [Silly Science \(Classification\)](#) (Student worksheet provided)
- [Mr. Peanut Lessons](#) (Student worksheet provided)
- [Mystery Bags](#)
- [Film Canister Fun](#)
- [Bioglyphs](#) (Student worksheets provided)
- [Pottery Pieces](#)
- [Innovative Inventions](#) - Internet project (Sites from the [Kid Zone](#)) (Student worksheet provided)
- [Inventor's Challenge](#) - Internet project (Sites from the [Kid Zone](#)) (Student worksheet provided)
- [A Journey Through Time](#) -Internet project (Sites from the [Kid Zone](#)) (Student worksheet provided)
- [Science A to Z Puzzle](#) (Student worksheet provided)
- [Super Scientist Challenge](#) (Student worksheets provided)

Also available ... [Metric Mania](#) - an assortment of lessons and links for the metric system!

Also available ... [Lesson Plan Links for General Science](#)
(includes scientific method, safety rules, and Science Fair resources)

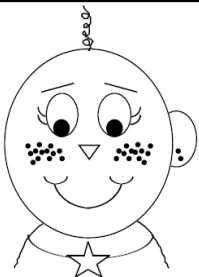
Links to my favorite online resources for lesson plans, activities, and worksheets.

Need Adobe Acrobat to view the worksheets on this site? Visit the [Adobe](#) site for details!

Discovery Days – Students develop experiments for elementary students and then invite them spend an afternoon investigating science topics.

Mystery Bags & Film Canister Fun – Students are challenged to identify items hidden in brown paper sacks or film canisters.

Silly Science – Use this lesson to introduce dichotomous keys. Students sort various items to learn their not-so-scientific names.



Bioglyphs – I use this lesson at the start of the year and tie it into classification. Students use a code to create their glyph and other students are challenged to identify each one using only yes/no questions.

Online Resources



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General Science Lesson Plan Links

[AskERIC - EduRef - Process Skills](#) - Visit this site for an assortment of lessons for process skills.

[Biology Corner](#) - Scroll down the page to find several worksheets for the scientific method, such as Controls and Variables, Pendulum Experiment, and Scientific Method Applied.

[Blue Web'n General Science](#) - A collection of links for general science lessons and activities.

[Bubble Town](#) - A great site to learn more about bubbles, blowing techniques, and recipes! Challenge your students to use the scientific method to determine the best bubble recipe or the best blowing method! Also visit the [SDA Bubbles](#) site for more great ideas!

[CIESE Collaborative Projects](#) - Join a project and challenge your students to apply their knowledge of the scientific method and data collection!

[COILS - Science Experiments Page](#) - Check out this great resource for ideas to explore nature with your students and learn about the process of scientific inquiry. Try the [Schoolyard Inventory Activity](#), [Schoolyard Flower Experiment](#), or one of the other great project ideas! Also visit the [IBSP Challenging Problem Science](#) page at for other project ideas!

[Designing Experiments](#) - Explore this unit for great ideas to help your students understand the process of scientific inquiry.

[Doing Science - The Process of Scientific Inquiry](#) - Explore these resources from the National Institutes of Health exploring scientific inquiry, critical thinking skills, and scientific research

[Find Out Why](#) - Browse the listing of family activities to find experiment ideas for your students!

[JollyTime](#) - Click the link for Popcorn Science and learn how to explore the scientific method with the lessons provided at this website!

[Nature of Science Lesson Ideas](#) - This page offers a variety of lesson ideas to explore scientific inquiry.

[Proteacher - General Science](#) - An assortment of general science lesson plans and links for elementary teachers. Also visit the [Invention/Technology](#) section.

[Qualitative & Quantitative Data](#) - A great lesson exploring different types of data and methods for analysis.
Want more data ideas? Visit the [Exploring Data](#) page of the Mathforum.org website.

[ReachOut Michigan](#) - Browse the alphabetical list of lessons for great ideas! Also check out the [Quick Experiments](#) section for more engaging ideas!

[Science-Class.net](#) - Find ideas for safety, process skills, scientific method, and more!

[Science Olympics](#) - An assortment of activities to challenge your students!

[Science Teaching Ideas - Safety](#) - Explore this area for great resources to teach safety.

[Teaching Ideas](#) - Visit this page for a listing of all the science activities available at this site.

[Whelmers](#)

Visit the
General Science Lesson Plan Links
page for more great ideas!



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Visit the **Kid Zone** for links to use with your students!





Questions?
Need help?
Comments?

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