

2016 K-8 Update

# Science A to Z

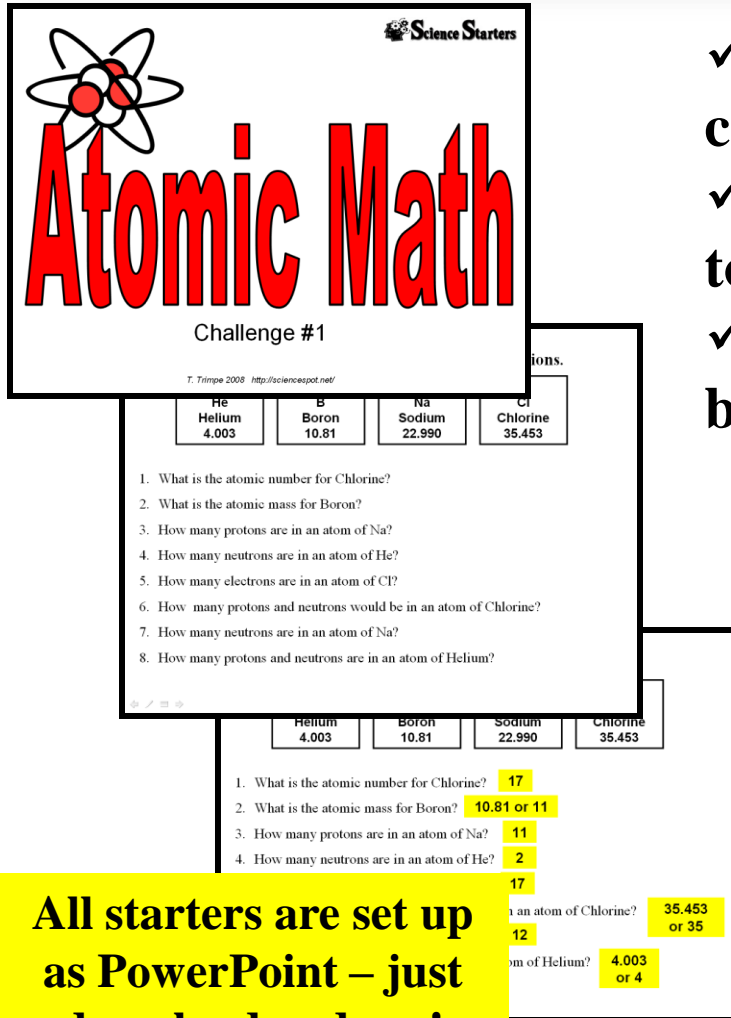
## Our Favorite Lessons

Presented by

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Start every class with a challenge!



**Atomic Math**  
Challenge #1

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

He Helium 4.003	B Boron 10.81	Na Sodium 22.990	Cl Chlorine 35.453
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1. What is the atomic number for Chlorine?
2. What is the atomic mass for Boron?
3. How many protons are in an atom of Na?
4. How many neutrons are in an atom of He?
5. How many electrons are in an atom of Cl?
6. How many protons and neutrons would be in an atom of Chlorine?
7. How many neutrons are in an atom of Na?
8. How many protons and neutrons are in an atom of Helium?

Helium 4.003	Boron 10.81	Sodium 22.990	Chlorine 35.453
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1. What is the atomic number for Chlorine? 17
2. What is the atomic mass for Boron? 10.81 or 11
3. How many protons are in an atom of Na? 11
4. How many neutrons are in an atom of He? 2

Helium 4.003	Boron 10.81	Sodium 22.990	Chlorine 35.453
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5. How many electrons are in an atom of Cl? 17
6. How many protons and neutrons would be in an atom of Chlorine? 12
7. How many neutrons are in an atom of Na? 12
8. How many protons and neutrons are in an atom of Helium? 4,003 or 4

- ✓ Review or reinforce vocabulary and key concepts
- ✓ Extend the classroom lessons with related topics in the news today
- ✓ Introduce new concepts to gauge background knowledge



Home Science Classroom Science Starters Science Clu

Main Page  
General Science  
Physical Science  
Life Science  
Earth Science & Astronomy

**The S**  
A resource for junior

All starters are set up as PowerPoint – just download and use!

Go to <http://sciencespot.net/> and click the link for Science Starters on the homepage

# The Science Spot

## Areas to Explore



### Science Classroom

*Lessons & activities from my classroom*



### Science Starters

*Review & reinforce science concepts with these daily class warm-up activities*



### Science Club

*Project ideas for clubs or classrooms*



### Nature Center

*Learn about our schoolyard garden program*



### Reference Desk

*An assortment of resources for NGSS & ISNs along with other educational websites*



### Mrs. T's Tech Corner

*My favorite tech resources and workshop links*



### Idea Factory

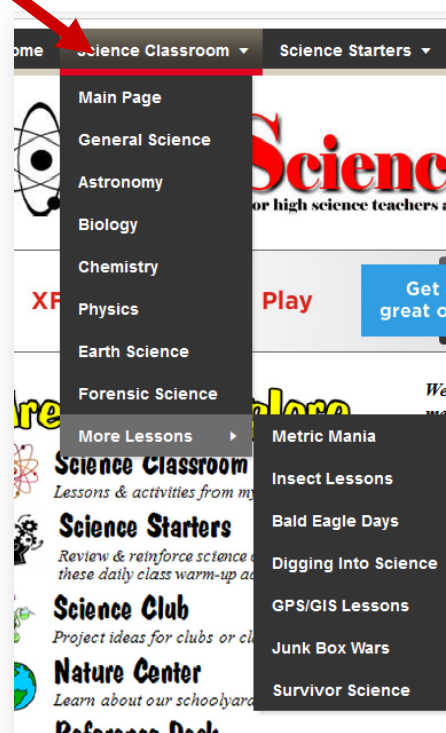
*Share your favorite teaching tips or find new ideas to use in your classroom*



### Puzzle Corner

*Word searches, crosswords, and challenges*

Click the link for the **Science Classroom** on my homepage or use the menu at the top of the page!



# Unit Resources

## The Science Classroom

Cruise through a sampling of my favorite science activities as well as great lessons submitted by other teachers.

General Science



Astronomy



Ecology



Chemistry



Earth Science



Physics



Biology



Adopt-An-Insect



Eagle Days



Metric Mania



Digging Into Science



Forensic Science

Questions? Visit the **FAQ** frequently asked question area for answers!

**Real Life Challenge** A career and life skills unit for junior high students

**SURVIVOR SCIENCE** OUT MEASURE, OUT BEAT, OUT ANALYZE, OUT THINK

**JUNK BOX WARS**

**Learning with GPS**

Click here for **Lesson Plan Links**

More resources available on these pages ...

[NGSS Resources](#) - Links to websites with more information as well as lesson and project ideas.

[Science Club](#) - Find project ideas that can be used for your classroom activities.

[Interactive Science Notebooks](#) - Tips from my classroom and links to other websites with great information related to ISNs.

[Mrs. T's Tech Corner](#) - Links to my resources for making the most of the technology you have available in your classroom!

[Science Education Links](#) - Explore these sites to find resources on a variety of science education topics.

[General Education Links](#) - Great sites for all educational areas and levels.

[Kid Zone](#) - A collection of links for use with your students.

[Idea Factory](#) - New ideas for classroom management and procedures to use in your classroom!

## Chemistry Lesson Plans

Lessons from my classroom

### Classroom Lessons

- [Case #1225: Christmas Cookie Mystery](#) (Worksheet provided)
- [Christmas Chromatography - Deck the Halls With Science](#) (Worksheet provided)
- [Adopt-An-Element](#) - Internet project (Sites from the [Kid Zone](#))
- [Atoms Family](#) (Worksheets provided)
- [Element Trading Cards](#) - Internet project (Sites from the [Kid Zone](#)) (Worksheets provided)
- [Periodic Table Basics](#) (Worksheets provided)
- [Bonding Basics](#) (Worksheets provided)
- [Bond with a Classmate](#) (Worksheets provided)
- [Balancing Act - Balancing Equations](#) (Worksheets provided)
- [Chemical Reactions](#) (Worksheets provided)
- [Playing with Polymers](#) (Worksheets provided)
- [Amazing Marshmallows - Boyle's Law](#) (Worksheet provided)
- [Bursting Balloons - Charles' Law](#) (Worksheet provided)
- [Tasty Solution](#) (Worksheet provided)
- [Messing With Mixtures](#) (Worksheets provided)

### Also check out ...

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

### Internet Lessons

- [Chemistry Scavenger Hunt \(pdf\)](#) - Internet lesson using the sites listed on the [Chemistry page](#) of the [Kid Zone](#).
- [Meet the Elements \(pdf\)](#) - Share the [Meet the Elements video](#) about elements and compounds with your students. Thanks to Christina Causland for sharing the worksheet.
- [Periodic Table](#)
- [Acid of the](#)



**The Science Spot**  
A resource for junior high science teachers and students



## Chemistry Lesson Plan Links

Check it out ... [PBS Kids - Design Squad](#) for ideas to address STEM concepts in your curriculum! Visit the [Parents & Educators](#) area for lesson plans and activity ideas!

[Building Big](#) - Explore structures at this PBS site! The site offers [interactive labs](#), [building challenges](#), an [Educator's Guide](#) with activities, and more!

[CFAITC.org - Simple & Complex Machines \(pdf\)](#) - Download this activity book for ideas for your simple machine unit. The lessons are geared for grades 2-5, but some may be modified for older students.

[Discovery Channel School - Physical Science](#) - A list of lessons and activities on a variety of physical science topics.

[Energy Quest](#) - This site offers an assortment of [educational resources](#) to explore energy!

[Energy Lesson Plans - Alliance to Save Energy](#) - Download hands-on lesson plans used in the Alliance to Save Energy Green Schools project - a unique collaborative effort by teachers, administrators, and maintenance staff which reduces school energy costs at the same time it educates students.

[Fear of Physics](#) - A great resource to create your own quizzes to

[K-S Aeronautics Internet Te](#) your students!

[Light: A Teaching Unit](#) - Ex who are planning to take the school's use of energy for lighting.

NOTE: Also visit the [Science of Light](#) website for more resources.

Links to online lessons/activities

Also try the [Kid Zone](#) for great sites for your students!

# Chemistry: Atoms & Elements

## Element Trading Cards

For this project you will need to use the Internet to research the elements in the Periodic Table. Each card must include:

- Periodic Table information
- Number of protons, neutrons, and electrons
- Discovery information (Person and date)
- Important Uses
- Pictures that illustrate one or more uses for your element

8 <b>O</b> Oxygen 15.98
P = ___ N = ___ E = ___
Discovered in _____ by _____
Important Uses: _____

Fill in the square with the information from the periodic table.  
\* Be sure to follow the same format!

Determine the number of protons (P), neutrons (N), and electrons (E).

Research your element to find out who discovered or named your element and give the year.

Provide at least 3 uses for your element.

Provide one or more pictures on the back of the trading card that illustrate uses for your element.

My elements are: \_\_\_\_\_

Project Due Date: \_\_\_\_\_

A list of periodic table sites has been provided on the Chemistry Links page of the Kid Zone!  
Go to <http://sciencespot.net/> and click Kid Zone!

## Adopt-An-Element

### Requirements:

1) **Complete an Adopt An Element information sheet.** (60% of grade)  
You may use a variety of reference sources. Possible ideas are encyclopedias (book or CD Rom), science encyclopedias, science catalogs, magazines, and/or Internet sites. Information sheets must be **neat, written in black ink, and contain all the information requested!** You also need to provide a **list of your sources** on the back of your information sheet. A minimum of three sources are required.

2) **Create an advertisement for your element.** (40% of grade)  
The advertisement must include the element's name, symbol, atomic number, atomic mass, cost, and an advertising slogan that describes one or more of its important uses. Advertisements must be neat, colorful, and contain all the information listed above. You may add pictures that relate to your advertisement theme.

### Example:

- Be sure to include:
  - ✓ Element's symbol
  - ✓ Element's name
  - ✓ Atomic number
  - ✓ Atomic mass
  - ✓ Ad slogan
  - ✓ Cost
  - ✓ Your name

33	74.9	Atomic Mass
<b>As</b>	Arsenic	Symbol & Name
Arsenic's a sure fire way to deal with a nasty rat. It works better than a mean old cat!		
Cost = \$3.20 for 1 gram		
John Smith		

### Element Baby Book

Cover Due: \_\_\_\_\_

Final Project Due: \_\_\_\_\_

In this project you will adopt an element from the periodic table. The element that you choose must have an atomic number from 1 - 20.

As a proud parent of your element you will create a baby book to remember each stage of your element's life.

This project will count as **TWO** test-project grades in science. You will also receive a grade in English/Language Arts. I will give you time in the library to research your element and some class time to work on your book. You may create your book on the computer, but it is not necessary.

### Sources of Information:

**Websites** to help you in your search (I will provide these.)

The **periodic table** in your book will give you some information.

### Encyclopedias

There will be two due dates: one for the cover so that it can be laminated, and one for the final project. I will bind each baby book. You may create your book on the computer, but it is not necessary.

### Requirements:

(Check each one as you complete it.)

- Cover page - 3 points
  - Name of element and your name
  - Decorative cover
- Page 1 - 36 points! This should be written in paragraph form.
  - Name of element (Give your element a first name)
  - Nickname of element (Symbol)
  - Birth date (date element was discovered)
  - Birth weight (atomic mass)
  - Birth height (atomic number)
  - Race (type of element)
  - Attending physician (Discoverer)
  - Gender (state of matter at room temperature)
  - Place of birth (country of discovery)
  - Personality (temperatures: boiling point and melting point)
- Page 2 - 5 points
  - Pronunciation rebus

Created by Lisa Curry - 2003

### Periodic Table Basics

Name \_\_\_\_\_

- Which elements had complete outer shells? Give the name and symbol for each.
- What do you notice about the location of the elements in #1?

### Periodic Table Basics

Step 1: Complete the squares for each element by adding the atomic number, name, and atomic mass.

Write the atomic number at the top of the square.

Write the element's name under the symbol.

Write the atomic mass at the bottom of the square.

Step 2: Determine the number of protons, neutrons, and electrons in each element.




Step 3: Create a Bohr diagram for each element.

Step 4: Draw the Lewis Structure for each element.

Step 5: Use the following colors to shade in the square for each element. You should ONLY color in the small square in the upper left-hand corner and not the entire card.

Green = Li & Na    Pink = O & S    Blue = Be & Mg    Purple = F & Cl  
Orange = B & Al    Red = C & Si    Tan = N & P    Yellow = He, Ne, & Ar

Step 6: Cut the cards apart and arrange according to atomic number in the pattern shown below. Once you have the cards arranged in the correct order, glue them to a large sheet of construction paper.

1	2			
B P = ___ N = ___ E = ___ Bohr Diagram  Lewis Structure B	Li P = ___ N = ___ E = ___ Bohr Diagram  Lewis Structure Li	Ne P = ___ N = ___ E = ___ Bohr Diagram  Lewis Structure Ne		

# 5th Grade



Pat  
Proton

Nelda  
Neutron

Elliott  
Electron

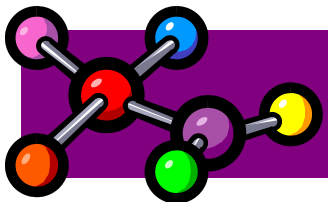
# Atoms Family

# 7th Grade

# 8th Grade

<b>F</b> Fluorine Atomic Number: 9 Atomic Mass: 19
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Also check out [Periodic Table Basics](#) to help your students discover the periodic properties and patterns in the table!



# Chemical Bonding

## Bonding Basics

Section A: Complete the chart using a periodic table.

Element	Atomic Symbol	Total Electrons
Chlorine	Cl	17
Potassium	K	19
Magnesium	Mg	12
Fluorine	F	9
Aluminum	Al	13
Sodium	Na	11
Nitrogen	N	7
Oxygen	O	8
Hydrogen	H	1
Carbon	C	6

## Bonding Basics (Headband Version)

Students use ping pong balls to create models of valence electrons and then explore how the atoms can form ionic or covalent bonds.



### Section B: Ionic Bonds

ANSWER KEY

What is an ionic bond?  
 • Atoms will transfer one or more electrons to another to form the bond.  
 • Each atom is left with a complete outer shell.  
 • An ionic bond forms between a metal ion with a positive charge and a nonmetal ion with a negative charge.

Example B1: Sodium + Chlorine  
 $Na^{1+} + Cl^{1-} \rightarrow NaCl$

Example B2: Magnesium + Iodine  
 $Mg^{2+} + I^{1-} + I^{1-} \rightarrow MgI_2$

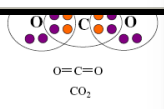
Example B3: Potassium + Iodine  
 $K^{1+} + I^{1-} \rightarrow KI$

Example B4: Sodium + Oxygen  
 $Na^{1+} + Na^{1+} + O^{2-} \rightarrow Na_2O$

Example B5: Calcium + Chlorine  
 $Mg^{2+} + Cl^{1-} + Cl^{1-} \rightarrow MgCl_2$

Example B6: Aluminum + Chlorine  
 $Al^{3+} + Cl^{1-} + Cl^{1-} + Cl^{1-} \rightarrow AlCl_3$

Challenge: What are some other ionic bonds that can be formed by the elements you used in the chart and their names.  
 Answers will vary.



### Bonding Basics - Ionic Bonds

Answer Key/Teacher Notes

Complete the chart for each element.

Element	# of Protons	# of Electrons	# of Valence Electrons	Oxidation Number
Sodium	11	11 → 10	1	1+
Chlorine	17	17 → 18	7	1-
Beryllium	4	4 → 2	2	2+
Fluorine	9	9 → 10	7	1-
Lithium	3	3 → 2	1	1+
Oxygen	8	8 → 10	6	2-
Phosphorus	15	15 → 18	5	3-

NOTE: I have the students use a red pencil to change the # of electrons to the amount it would be if the valence electrons were removed or added. They can see the difference between the number of protons (+) and electrons (-), which relates to the charge or oxidation number. If the ion has more protons (+), it would be a positive ion. If it has more electrons (-), it would be a negative ion.

Follow your teacher's directions to complete each ionic bond.

(1) Potassium + Fluorine

1- Write the symbols for each element.

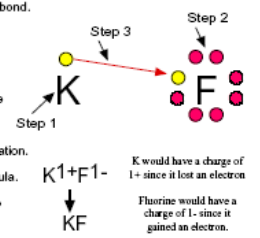
2- Use Fruity Pebbles (or other cereal/candy with more than one color) to create the Lewis structure for each.

3- Draw an arrow (or more if needed) to show the transfer of electrons and move the cereal to the new location.

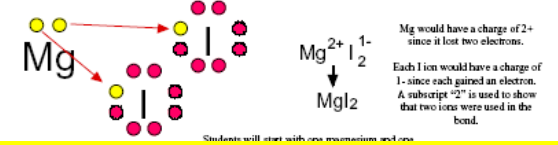
4- Determine the charge for each ion and write the formula.

5- Make sure the sum of the oxidation numbers is zero and write the chemical formula.

6- Have the students use a pencil or crayon to draw the electrons as they remove the pieces of cereal.



(2) Magnesium + Iodine



## Bonding Basics (Candy Version)

Students use small pieces of cereal or candy to model the transfer or sharing of electrons



# 8th Grade



# Chemical Reactions

Also available for Valentine's Day!

**Balancing Act**

Name \_\_\_\_\_

Atoms are not \_\_\_\_\_ or \_\_\_\_\_ during a chemical reaction. Scientists know that there must be the \_\_\_\_\_ number of atoms on each \_\_\_\_\_ of the \_\_\_\_\_.

To balance the chemical equation, you must add \_\_\_\_\_ to the \_\_\_\_\_ of the chemical formula in the equation. You cannot \_\_\_\_\_ or \_\_\_\_\_ subscripts!

1) Determine number of atoms for each element.

2) Pick an element that is not equal on both sides of the equation.

3) Add a coefficient in front of the formula with that element and adjust your counts.

4) Continue adding coefficients for the same number of atoms of each element on each side.

Try these:

$\square \text{C}_2\text{H}_6 + \square \text{O}_2 \rightarrow \square \text{CO}_2$

$\square \text{C}_2\text{H}_6 + \square \text{O}_2 \rightarrow \square \text{CO}_2 + \square \text{H}_2\text{O}$

$\square \text{N}_2 + \square \text{H}_2 \rightarrow \square \text{NH}_3$

$\square \text{CaO} + \square \text{C} \rightarrow \square \text{Ca} + \square \text{CO}_2$

$\square \text{H}_2\text{O} \rightarrow \square \text{H}_2 + \square \text{O}_2$

**Balancing Equations Challenge**

Part 1: Balance the following chemical equations.

$\text{O}_2 \rightarrow \text{O}_3$

$\text{C}_2\text{H}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$

Part 2: Label the chemical equation using PRODUCT, REACTANTS, or BOTH REPLY, OVERVIEW.

$2 \text{Mg} + \text{O}_2 \rightarrow 2 \text{MgO}$

**Balancing Equations Online**

Go to the Master & Atom page of the K&LZ on at <http://www.ck12.org> to find the links on this page.

**SITE#1: Chemical Equations**

- What does the thing that a balanced equation show you?
  - The \_\_\_\_\_ which takes into a reaction.
  - The \_\_\_\_\_ which are formed by the reaction.
  - The amount of each substance \_\_\_\_\_ and \_\_\_\_\_ produced.
- What do things that are reactants when balancing equation?
  - Every chemical compound that is \_\_\_\_\_ which cannot be \_\_\_\_\_.
  - A chemical \_\_\_\_\_ must account for every \_\_\_\_\_ that is used, which is an application of the Law of \_\_\_\_\_ of \_\_\_\_\_.
- What does the  $\rightarrow$  mean?
- Write a balanced chemical equation that illustrates each type of reaction.
 

Synthesis: \_\_\_\_\_

Decomposition: \_\_\_\_\_

Single-Displacement: \_\_\_\_\_

Double-Displacement (Metathesis): \_\_\_\_\_

**SITE#2: Classic Chemistry** - You will need to go back to the Master & Atom page of the K&LZ on!

- Click the button for "Use-Items" and read carefully. Click the "SIC" button and return to the game screen.
- Click "Start Game" button to start a game?
- Click on adding "O" atoms first and compare the number of atoms of each element you have on each side.
- Change coefficients to balance each equation and click the "Balance" button to check it. Check if it's wrong.
- Use the information in the [www.ck12.org](http://www.ck12.org) to answer each question and then write the balanced equation below.

What does "Balance" mean? \_\_\_\_\_

What color is added? \_\_\_\_\_

What is HCl? \_\_\_\_\_

When is it balanced on one side? \_\_\_\_\_

More to do? \_\_\_\_\_

T. Trimpe 2002 <http://www.ck12.org>

**Christmas Cookie Mystery**

Mrs. Claus needs your help! Each Christmas, Mrs. Claus makes a batch of her special sugar cookies to give Santa all the energy he needs to deliver presents to all the good little boys and girls around the world. A bad little elf has snuck into the kitchen and messed up all the special baking powders.

He has left a note with three mystery bags of white powder. The North Pole Bureau of Investigations has provided samples of six white powders found at Santa's house and the three mixtures left by the elf.

Without your help, Mrs. Claus will not be able to make her cookies and there will be no Christmas! Help Mrs. Claus save Christmas!

Part 1: Follow the directions to test each sample (# 1-6) with water, vinegar, iodine, and heat. Record your observations in the top part of the chart on the back of this page.

Part 2: Follow the same procedure to test the three Mystery Mixtures (A, B, and C). Record your observations in the bottom portions of the chart. Use your results from Part 1 to determine which mixture is the special sugar cookie mix!

T. Trimpe 1999

## Balancing Equations

## Christmas Cookie Mystery

## 8th Grade

## 7th Grade

**Playing with Polymers**

8th Grade Science  
Mrs. Tracy Trimpe  
Havana Junior High School

**Playing with Polymers**

**Slime Tests**

Description - How does your slime look like, feel, smell (waft), etc.?

Slime Rating - Rate it from 1 = not very slimy to 5 = very slimy

Slime Poke Test - Roll the slime into a ball and slowly poke your finger into the slime. What happens? Does your finger go into the goop?

Slime Quick Poke Test - Roll the slime into a ball and quickly poke the slime with your finger. What happens? Does your finger go into the goop?

Slime Pull Test - Roll the slime into a ball and slowly pull on the ends with your fingers. What happens? Write your observations on your worksheet.

Slime Pull Test - Roll the slime into a ball and slowly pull on the ends with your fingers. What happens? Write your observations on your worksheet.

Slime Grab Test - Grab a timer. Roll your slime into a ball and sit it on your plate or table. How long does it take for it to flatten out?

Slime Grab Test - Grab a timer and a ruler. Roll your slime into a ball and hold it a height of 30 cm above the table. Time how long it takes for the slime to touch the table.

Slime Drop Test - Roll your slime into a ball and drop from a height of 30 cm above the table. What happens? Write your observations (how high it bounces) on your worksheet.

## Playing with Polymers

**Design a Firework**

Work the table. Fireworks! Making Color tables to draw and complete the following information.

1) Using your \_\_\_\_\_, draw a sketch of the firework in outline.

2) Write the color and the name of the color.

Color	Chemical Name

3) Write the color and the name of the color.

4) Write the color and the name of the color.

5) Write the color and the name of the color.

6) Write the color and the name of the color.

7) Write the color and the name of the color.

8) Write the color and the name of the color.

9) Write the color and the name of the color.

10) Write the color and the name of the color.

T. Trimpe 2002

**Design a Firework!**

Work the table. Fireworks! Making Color tables to draw and complete the following information.

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10) Write the color and the name of the color.

T. Trimpe 2002

## Design-A-Firework







# More Biology ...

## Cell Classroom & Projects

Turn your classroom into a cell and challenge them to create a cell analogy.

## Organ Trail

Students are assigned a specific organ and have to create a “Wanted” poster

## Cell Classroom

Organelle	Item/Person	Function
Nucleus	Teacher	Control center of the cell; has the instructions the cell needs to function
Cell Wall	Door Frame (Inside of walls)	Provides structure for the cell
Cell Membrane	Wall	Supports the outside of the cell
Cytoplasm	Air (hang off the lights in room)	What the organelles “float” in
Mitochondria	“Light” person	Responsible for producing the energy (light) for the cell or the projector
Vacuoles	File Cabinet, Trash Can, or Student Desk	Used to store materials, water, or wastes
ER or Endoplasmic Reticulum	3-4 students	Responsible for transporting materials from one part of the cell to the other
Lysosomes	3-4 students	Responsible for cleaning up the cell
Ribosomes	3-4 students	Produces proteins for the cell (passes out treats)

Note: Adjust the number of lysosomes, ERs, or ribosomes to adjust to the size of your class.

**Challenge:** What items/people in the school building could be used to represent each organelle?

### The Organ Trail

#### Teacher Information

**Objective:** Students will use internet resources to research an organ to learn how it works w organ systems to keep the body healthy. The information gathered will be used to create a j of display) to share what they learned with their classmates.

**What organs do you use for this project?** Go to <http://www.organsofthebody.com/> to find could be used for this project. Print a list of the organs and have students draw a slip to selec

**Do students work in pairs or individually?** Students usually work on their own, however depending on the ability level of your students.

**How much time do you give students to complete the project?** Students usually need minutes each).

**Where can students find links to help them complete this assignment?** A list of be available on the Health & Human Body links page at the Kid Zone at <http://sciencspot.net> use search engines or other online resources.

**How do you grade the student projects?** A sample rubric has been provided in this down modify it to your students needs.

**What do students do with their finished posters?** Allow time for students to share their classmates either in small groups or as a class presentation.

#### Extension ideas include:

- > Have the students stand in a large circle facing the center. Provide yarn to connect the organ they researched for the project. Start with one student and have him/her tell the name choose another student to connect to using the yarn. The student should give a reason for on what they learned. Continue building connections until all the students are included in activity, but require students to connect to a different organ each round.
- > Have the students organize themselves into various groups based on characteristics you pre you were to say digestive system, the students who play a major role in the digestive system area of the room. Other examples would include size (larger, smaller, or equal to a femu- body (top to bottom or everywhere), or whether or not it is needed for life (heart vs. gills) also have the students line up alphabetically or organize themselves by the actual size of the

Do you have other extension ideas? Send them to me at [ttonm@sciencspot.net](mailto:ttonm@sciencspot.net)



# Blood Mobile

# Even More Biology ...

## DNA Keychains

Get some beads and wire to make some DNA of your own. A video tutorial will soon be available!

## Protein Power Game – Protein Synthesis

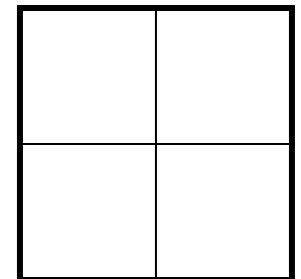
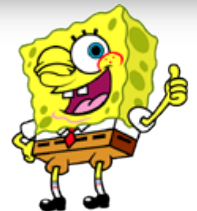
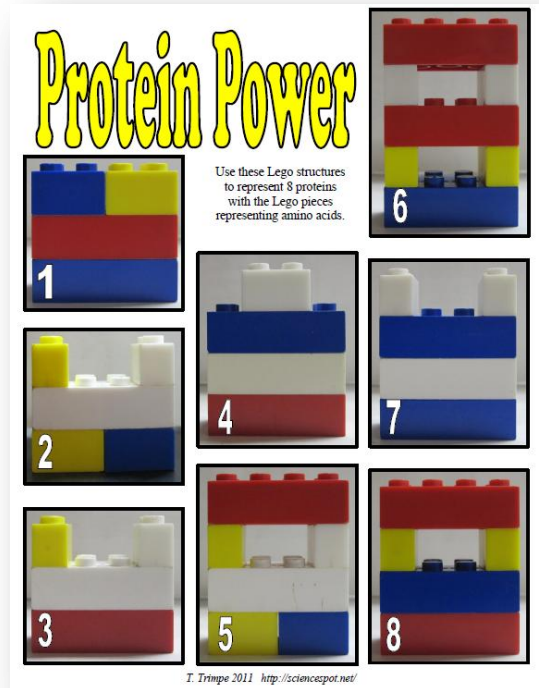
Explore the process of protein synthesis and reinforce knowledge of cell organelles at the same time!

## SpongeBob Genetics

A fun activity to introduce the use of Punnet squares and genetics! Check out the Biology page of the Science Classroom for tons more ideas!

*SpongeBob SquarePants recently met SpongeSusie Roundpants at a dance. SpongeBob is heterozygous for his square shape, but SpongeSusie is round. Create a Punnett square to show the possibilities that would result if Bob and Susie had children. HINT: Use S for square and s for round!*

- What are the chances of a child with a square shape? \_\_\_\_%
- What are the chances of a child with a round shape? \_\_\_\_%

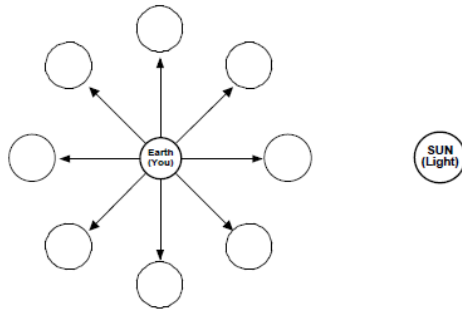


# Astronomy

Moon Phases

Name \_\_\_\_\_

Directions: Get a "moon pop" from your teacher. Hold the moon pop in front of you at each position in the diagram making sure the white side is always facing the sun. Shade in the circle on the diagram to match the amount of the white side you see on your moon pop.



1. Label each phase on the diagram: New moon, Full moon, Waxing crescent, Waning crescent, Waxing gibbous, Waning gibbous, First quarter, and Last quarter.

2. After you have completed and labeled the diagram, show your teacher to have this box initialed.

resources/lunar\_edu.html

## Lunar Lollipops

A great way to teach the phases of the moon!

## Paper Plate Astronomy

<http://analyzer.depaul.edu/paperplate/activities.htm>

A lot of great astronomy lessons using paper plates for models along with ideas for other topics in science and math!



## Gravity Exploration

Name \_\_\_\_\_

Part A: How much would you weigh on other planets and the moon?  
The more mass a planet has, the more gravity it has. Planets which have more mass than Earth would have more gravity than Earth. A person would weigh more on these planets than they do on Earth.

Location	Weight on Earth	Gravity	Calculated Weight
Moon	X	0.17	=
Mercury	X	0.38	=
Venus	X	0.86	=
Mars	X	0.38	=
Jupiter	X	2.87	=
Saturn	X	1.32	=
Uranus	X	0.93	=
Neptune	X	1.23	=

Part B: How far could you jump on other planets and the moon?  
Determine how far you can jump on the Earth. To do this, place a piece of tape on the floor as a starting line. Jump as far as you can off of both feet. Have your partner mark where you land not where you end up! Measure the distance and record in the table. Do this five times, then find the average.

Jump 1	Jump 2	Jump 3	Jump 4	Jump 5	Average

Location	Average Length on Earth	Gravity	Length
		0.17	=
		0.38	=
		0.86	=
		0.38	=
		2.87	=
		1.32	=
Uranus		0.93	=
Neptune		1.23	=

## Gravity Exploration

Learn about mass vs. weight and how gravity affects weight!

# More Astronomy ...

## Make a Comet

<https://www.noao.edu/education/crecipe.html>

A favorite demonstration using dry ice and other materials to simulate a comet



## Design-An-Alien

<http://www.unawe.org/activity/eu-unawe1304/>

Students apply their knowledge of the planets to create aliens that would survive on each one!



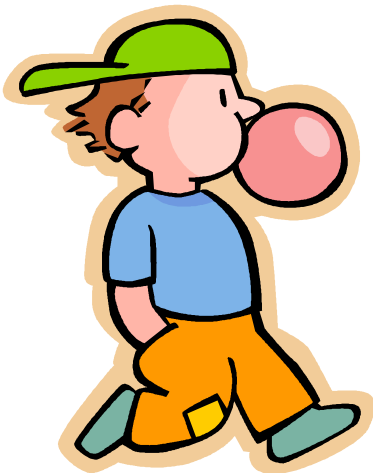
# Physics

## [CRASH & Understanding Car Crashes](#)

Explore the physics involved in car crashes while investigating actual accident photos, police reports, etc.

## [Blood Spatter](#)

Students explore the physics of spatter as they experiment with fake blood to make passive or projected patterns. Also check out the other [forensic science](#) lessons I have available – fingerprints, blood typing, tool marks, chromatography, anthropology, entomology, & more!



## [Bubble Gum Physics](#)

What is your chomping speed? Are you accelerating or decelerating?

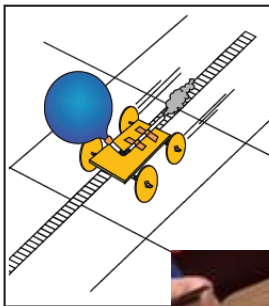
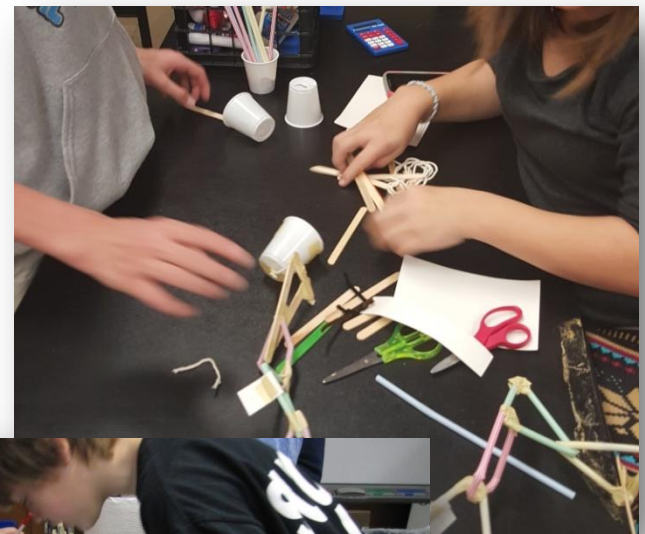
Also check out **Hot Wheelin' Physics** and **Speed Machines** on the Physics Lessons page of my website.

# Junk Box Wars

What can your students do with a bag/box of junk? Over 12 projects available – PPT, student worksheets, and teacher info provided!

# Balloon Race Cars -

Challenge your students to create a car using balloon and assortment of materials.



## Rocket Activity Rocket Races

**Objective**  
Students investigate Newton's third law of motion by designing and constructing rocket-powered racing cars.

**Description**  
Individual students construct racing cars from Styrofoam food trays and power them with the

- National Science Content Standards
  - Unifying Concepts and Principles
    - Change, constancy, and measurement
  - Science as Inquiry
    - Abilities necessary to do scientific inquiry
  - Physical Science
    - Position and motion kinematics
    - Motions and forces
  - Science and Technology
    - Abilities of technology
- National Mathematics Content Standards
  - Number and Operations
  - Geometry
  - Measurement
  - Data Analysis and Probability
- National Mathematics Process Standards
  - Problem Solving
  - Reasoning and Proof
  - Communication
  - Connections
  - Representations



# Earth Science

## Ride the Rock Cycle

Students complete an online scavenger hunt and are challenged to create a story about a rock's journey (or ride) on the rock cycle.

## Rocks & Minerals

Mineral ID Challenge – Activity using mineral kits set up at six stations to learn about mineral tests used for identification

Everyday Geology – An online activity exploring the uses of rocks and minerals in our everyday lives  
Also check out the Mighty Minerals unit for more lessons/activities like this one!

Sediment Bottles – A fun activity to see how sedimentary rock forms

Candy Bar Tectonics – Students use Milky Way candy bars to simulate plate motion and forces.

**Ride the Rock Cycle** Name \_\_\_\_\_

Go to the Science Spot's Kid Zone and click the link for Rocks & Minerals to find these sites.

Site #1: Study Jams- Watch the video to complete this section and then do the quiz.

- Complete: Heat and pressure melts \_\_\_\_\_ rock and turns it into \_\_\_\_\_. When it cools it becomes \_\_\_\_\_ rock.
- Igneous rock can be broken down by \_\_\_\_\_ and the pieces moved around by erosion. The mix of pieces become \_\_\_\_\_ rock, such as limestone.
- The weight and pressure of \_\_\_\_\_ rock, such as marble.
- Try the quiz by clicking \_\_\_\_\_.

Site #2: Layered Earth

- The rock cycle shows \_\_\_\_\_.
- What is magma? \_\_\_\_\_
- What is the process of \_\_\_\_\_?
- What is the difference between \_\_\_\_\_ and \_\_\_\_\_?
- What process breaks \_\_\_\_\_?
- What process causes \_\_\_\_\_?
- What happens during \_\_\_\_\_?
- How are chemical \_\_\_\_\_?
- What does heat and \_\_\_\_\_?
- Which type of \_\_\_\_\_?
- Click "Test Your Knowledge" \_\_\_\_\_.

### Ride the Rock Cycle - Your Turn

Imagine if you and a buddy were able to take a ride on a rock cycle ...

- What "theme" would you have for your story?
- Where would you start?
- What would happen during your journey?
- How would you change from one type of rock to another?

Create a story (children's book, cartoon, animation, etc.) about your imaginary ride on the rock cycle. You may complete the story on paper or electronically.

You need to include all three families of rocks along with the various processes involved to change them from one type to another over time. Use the word lists to help you! To earn credit for using a word you must include a definition or use it in context to give readers clues to its meaning.

**Ready?**

- 1st - Make a brief outline of your story in the space at the bottom of this page.
- 2nd - Create your story on paper (construction paper, computer paper, or poster board) or use an electronic tool to help you.  
*NOTE: Go to the Tech Skills page of the Science Spot's Kid Zone to find websites that will help you create an electronic story, cartoon, or animation.*
- 3rd - Have another group review your work. Make additions or corrections to your project based on their review.
- 4th - Submit your project to your teacher for a final grade. You will need to turn in the Peer Review worksheet as well.

### Word List:

- Chemical
- Clastic
- Cooling
- Erosion
- Extrusive
- Foliated
- Heat
- Igneous
- Intrusive
- Lava
- Magma
- Melting
- Metamorphic
- Nonfoliated
- Organic
- Pressure
- Sedimentary
- Weathering

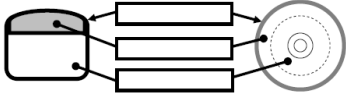
### Bonus Words:

- Coal
- Gneiss
- Granite
- Limestone
- Marble
- Obsidian
- Pumice
- Quartzite
- Rhyolite
- Sandstone
- Shale
- Slate

**Candy Bar Tectonics** Name \_\_\_\_\_

**Part A: Getting Ready**

- Use your fingernail to make small cracks in the surface of your "Earth" or candybar. Place on a paper towel.  
What do we call the cracks in the Earth's surface? \_\_\_\_\_  
What do we call the large pieces of Earth's crust? \_\_\_\_\_
- Compare the candybar to the Earth's structure. Label the parts of the candybar to correspond to the layers of the Earth.



- Which layer is "missing" in the candybar? \_\_\_\_\_

**Part B: Observing Forces**

**COMPRESSION**

What do you observe as you apply this force? \_\_\_\_\_  
At what type of plate boundary would this force occur? \_\_\_\_\_  
At what type of fault would this force occur? \_\_\_\_\_

**TENSION**

What do you observe as you apply this force? \_\_\_\_\_  
At what type of plate boundary would this force occur? \_\_\_\_\_  
At what type of fault would this force occur? \_\_\_\_\_

**SHEARING**

What do you observe as you apply this force? \_\_\_\_\_  
At what type of plate boundary would this force occur? \_\_\_\_\_  
At what type of fault would this force occur? \_\_\_\_\_

**Part C: Applications**

Where else might we observe the three types of forces? Give at least three examples.

# More Earth Science

## [JBW - Super Structures](#) (Earthquake Proof Structures)

Students learn about the forces that affect buildings while they complete the [Building Big Online Activity](#) and then build their own structures using “junk”. After initial testing, students are challenge to make modifications based on earthquake hazards and tested again using a “shake” table.

## [Digging Into Science](#)

Students take on the role of paleontologists as they excavate and document a dig site created using a homemade “sandstone” mixture and turkey bones. Visit the link to find the project description, project pages, and links to online resources.

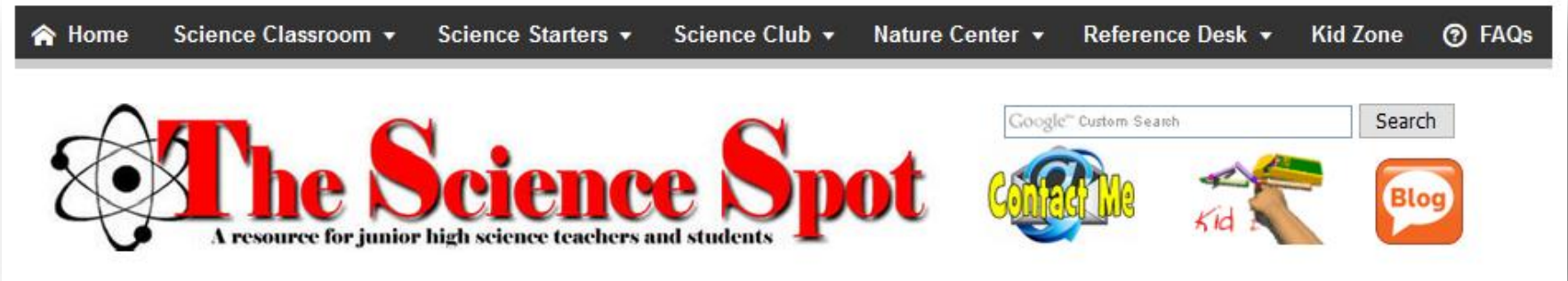


## [GPS](#)

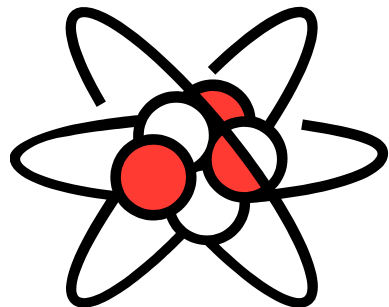
Explore the use of GPS technology using schoolyard scavenger hunts and other lessons or try some geocaching with your students.



# Contact Information



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