7 th and 8th Grade Science Checklist for Days 1-10

Day 1

7th Grade: "Motion" Crossword_____

8th Grade: Page 1 of "Cooking with Elements"_____

Day 2

7 th Grade: "Speed, Velocity, and Acceleration" Crossword_____

8th Grade: Page 2 of "Cooking with Elements"_____

Day 3

7th Grade: Page 1 "Speed Machine"_____

8th Grade: Page 1 of "Counting Elements"_____

Day 4

7th Grade: Page 2 "Speed Machine"_____

8th Grade: Page 2 of "Counting Elements"_____

Day 5

7th and 8th Grade: Human impact on the Environment and Conservation Seek & Find Activity _____

Day 6

7th and 8th Grade: Newton's First and Second Laws of Motion _____

Day 7

7th and 8th Grade: Newton's Third Law of Motion _____

Day 8

7th and 8th Grade: Page 1 of Balanced VS Unbalanced Forces _____

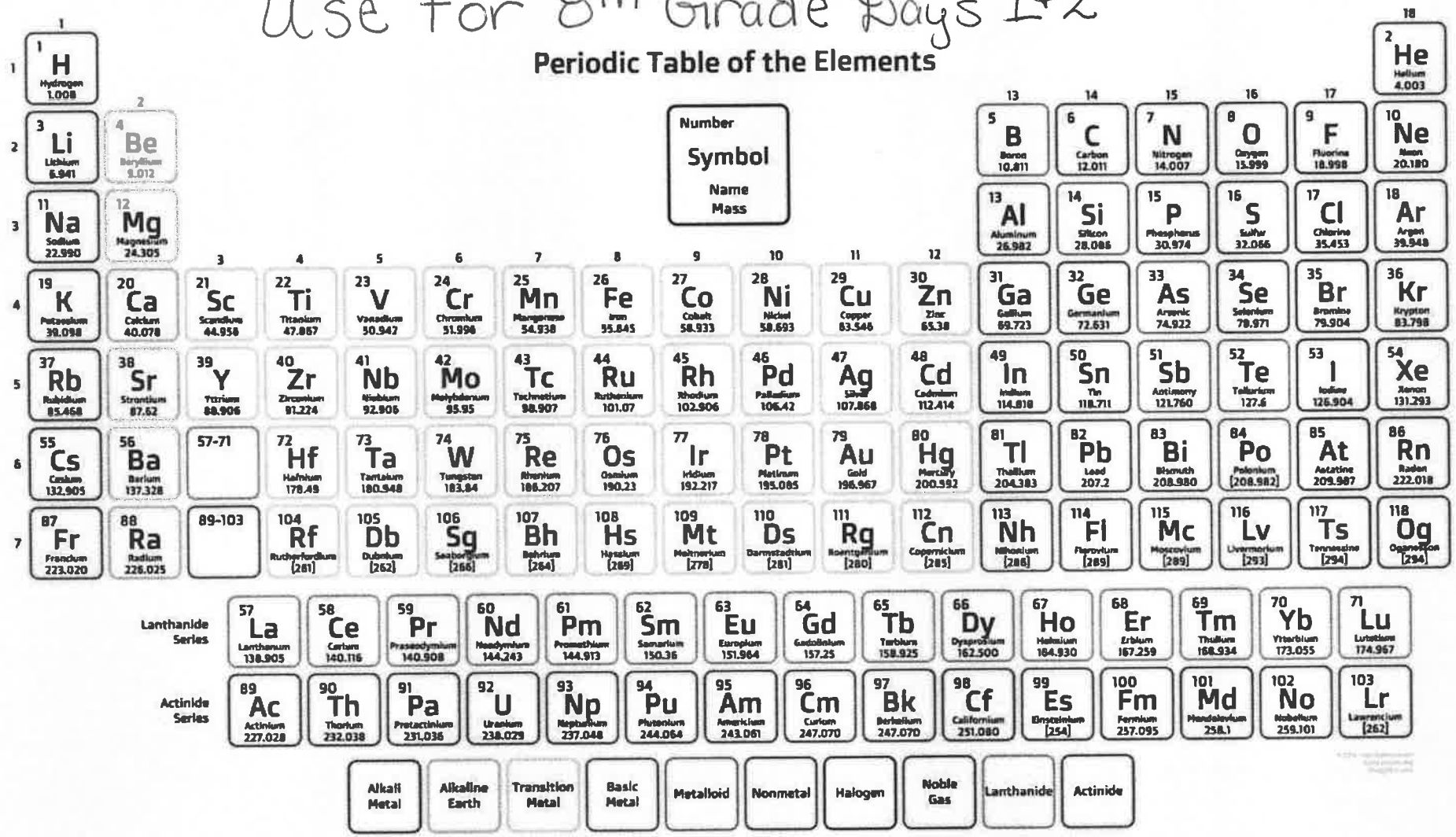
Day 9

7th and 8th Grade: Page 2 of Balanced VS Unbalanced Forces _____

Day 10

7 th and 8th Grade: Lab Safety Review _____

Use for 8th Grade Days 1+2



8th Grade
* Day 1 - Complete 1-5
* Day 2 - Complete 6-10

Name_____ Date

Activity 1 4: Cooking with the Elements

Directions: For each element combination in parentheses below, use the symbols for thf elements to obtain a scrambled word. Then unscramble the letters to form the correct words. Write the symbols in the answer blank following each group f elements. This will help you complete each numbered paragraph.

> Example: (boron, indium, oxygen, tantalum) = BInOTa, which unscrambles to form the word OBTaIn.

1. For breakfast we (yttrium + francium) eggs, (cobalt + nitrogen + barium) _____ and (hydrogen + hydrogen + arsenic) (oxygen + nitrogen + tungsten + bromine) _____ potatoes, and toast (astatine + tungsten + helium) _____ or (hydrogen + tellurium + tungsten + iodine) bread. Or, we can have (nitrogen + calcium + einsteinium + protactinium + potassium) or waffles and sausage, or (aluminum + cerium + rhenium) such as (radon + cobalt) _____ (lanthanum + potassium + fluorine + einsteinium) (nitrogen + iodine + silicon + radium)_____ (boron + nitrogen + radium) with milk. _____ ,

2. (thorium + helium + aluminum + _____ yttrium)(potassium + actinium + sulfur tin)_____would be fruits, such as (sodium + sodium + barium + sulfur) _____, grapes, (sulfur + iodine + tungsten + potassium + iodine) apples, and oranges and different (einsteinium + carbon + helium + einsteinium) _____and (potassium + chromium + erbium + actinium + sulfur)
   Of course, most of us would (erbium + radium + thorium) have (hydrogen + phosphorus + sulfur + carbon + iodine) (iodine + oxygen + cobalt + pota sium + einsteinium)_____ , or (nitrogen + dysprosium + calcium)

3. For drinks, we (fluorine + phosphorus + rhenium + erbium) (calcium + cobalt + lanthanum + cobalt)_____or another type of soda (vanadium + erbium + oxygen) _____ milk, juice or (erbium + astatine + tungsten) _____ .

4. Most people have fast food and (selenium + _____ uranium)the drive (ruthenium + sulfur + thorium)_____ for lunch. They usually have only half an hour and (oxygen + carbon + selenium + holmium)_____ (carbon + tantalum + osmium) _____ or hamburgers and French (einsteinium + iodine + francium) _____ .

8th Gr.
Days 1+2

Sometimes they will be (carbon + yttrium + lutetium + _____ potassium)and have a salad, (uranium + phosphorus + _____, sulfur + oxygen)sandwich, or (neon + iodine + _____ hydrogen + selenium + carbon)take-out. At (erbium + oxygen + thorium)_____times, people, especially students, eat (holmium + sulfur + carbon + sodium)_____ or (carbon + lithium + iodine + hydrogen) _____cheese (iodine + francium + einsteinium) _____.

(continued)

Name _____ Date _____

Activity 14: **Cooking with the Elements** *(continued)*

5. Dinners are the big meals. (iodine + sulfur + _____ thorium)is (helium + tungsten + nitrogen)_____ families (thorium + _____ gallium + erbium) together after a long day. Dinners usually consist of a main dish containing some type of meat. The meat can be (neon + _____, _____, terbium + oxygen)(americium + hydrogen) _____ ,pork (sulfur + _____ phosphorus + carbon + holmium) chicken, (boron + barium + yttrium)_____ (carbon + barium + potassium) ribs, prime rib, or (iodine + hydrogen + sulfur + fluorine) _____.

6. Of course, there is always some type of carbohydrate. (iodine + thorium + sulfur) _____ is usually a potato, which we can bake, mash, (yttrium + francium) _____ ,scallop, or boil. For variety, there is also rice or (tantalum + arsenic + phosphorus)_____.

7. There usually is a (holmium + cerium + iodine + carbon)of vegetables. _____

   Some (sulfur + carbon + iodine + holmium + _____ cerium)are (radon + cobalt) _____ ,peas, (cobalt + lithium + oxygen + bromine + carbon) beans, _____,

   (silver + arsenic + phosphorus + uranium + argon + sulfur)or squash. _____

8. One of my favorite (sulfur + uranium + sulfur + oxygen + phosphorus)is _____

   (tungsten + neon)_____ England (americium + chlorine) chowder. I _____

8th Grade Days 1+2

(gold + sulfur + tellurium) _____ the (nitrogen + barium + cobalt) _____ and (nitrogen + oxygen + nickel + oxygen + sulfur) _____ first. Then I add (astatine + tungsten + erbium) _____ , (sulfur + chlorine + americium) _____ , celery, and (iodine + sulfur + sulfur + phosphorus + cerium)_____ such as (yttrium + barium) _____ leaf, thyme, and marjoram. The diced potatoes and (rhenium + carbon + americium)_____ are added about thirty minutes (oxygen + rhenium + beryllium + fluorine)_____ serving.

9. The best part is dessert. There are many different (potassium + calcium + einsteinium) _____and (iodine + einsteinium + _____ phosphorus) (uranium + rubidium + rhodium + barium)_____looks like red celery, and is tart (helium + tungsten + nitrogen)_____ baked in (phosphorus + einsteinium + iodine)

_____.

Another simple dessert is (cerium + _____ iodine)(americium + carbon + rhenium) _____ (iodine + _____ thorium + sulfur) can be served with (erbium + oxygen + thorium) _____ _____ desserts or (yttrium + boron) itself, in a (neon + cobalt) _____ _____or a dish, (iodine + thorium + tungsten) (cobalt + tellurium + carbon + lanthanum + holmium)or (yttrium + neodymium + calcium)_____toppings.

10. A fancy dessert is (phosphorus + rhenium + carbon + _____ einsteinium)with a _____ (neodymium + boron + radium + yttrium)sauce. Many (neon + _____ iodine + fluorine) _____ restaurants will (cerium + lanthanum) their desserts with (nitrogen + boron + dysprosium + radium)to make a flaming dessert.

_____

*Notes for 8th Grade to help with "Counting Elements" Activity on Days 3+4

HOW TO COUNT ATOMS

Background Information:

- **subscripts** – the little numbers that tell how many atoms there are (ex: In $3H_2O$, the $_2$ is the subscript)
- **coefficients** – regular-sized numbers that tell how many molecules there are (ex: In $3H_2O$, the **3** is the coefficient)

Example: $3H_2O$

- The subscript $_2$ in the example above comes after the H. This means there are **two H's** (hydrogen atoms) in **each** molecule.
- The coefficient **3** shows that there are **three** of the H_2O molecules.

We could draw each molecule to help show us how many atoms are present.

Now we can count the number of H's and the number of O's.

$3H_2O$ has **6 hydrogen atoms** and **3 oxygen atoms**.

However, drawing out each equation is **NOT PRACTICAL.** The number of atoms can be counted **without** having to draw it out.

To find out the number of atoms: **MULTIPLY all the SUBSCRIPTS in the molecule by the COEFFICIENT.** (This will give you the number of atoms of each element.)

To mathematical find the number of elements that make up $3H_2O$, we multiply the $_2$ by the coefficient 3 to find that there are 6 H's. Then we multiply the $_1$ by the coefficient 3 to find that there are 3 O's.

NOTE: Although the $_1$ is usually not written, $3H_2O$ can be written as $3H_2O_1$.

(In other words, $3H_2O$ and $3H_2O_1$ are the same thing.)

HOW TO COUNT ATOMS IN A CHEMICAL FORMULA

(5 Easy Steps)

Step 1: **Write** the chemical formula

Step 2: **List** all the atoms

Step 3: **Count** the number of atoms of each element in **1** molecule.

Step 4: **Multiply** the number of atoms of each by the **coefficient**.

Step 5: Make sure your answer **makes sense**.

Practice Examples

6 C_2H_5OH (Ethanol)

C - 2*6=12
H - 6*6=36
O - 1*6=6

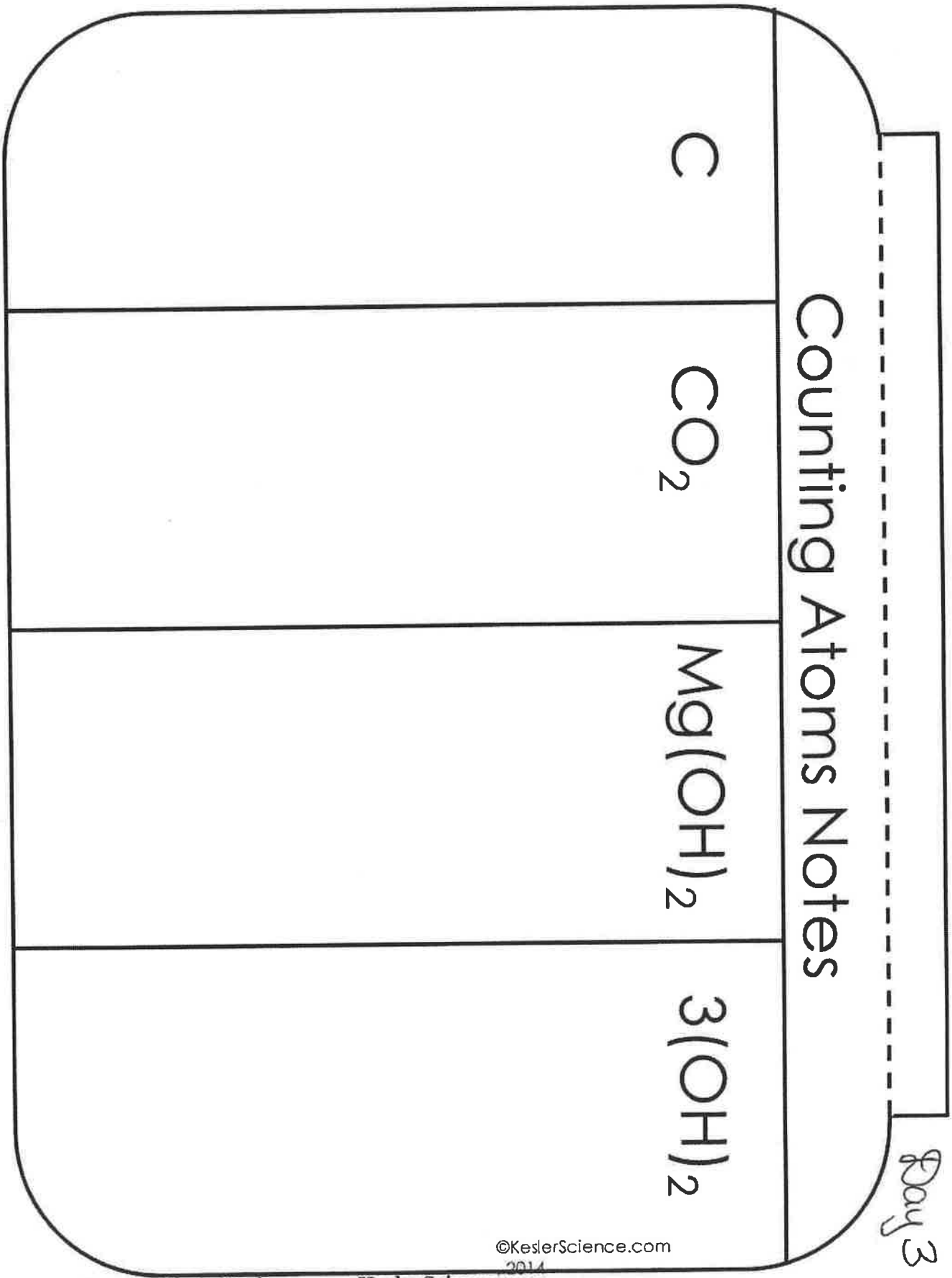
4 $C_6H_{12}O_6$ (Glucose - Sugar)

C - 6*4=24
H - 12*4=48
O - 6*4=24

5 $Ca(OH)_2$ (Calcium Hydroxide)

Ca - 1*5=5
O - 2*5=10
H - 2*5=10

Counting Atoms and Elements



Counting Atoms and Elements

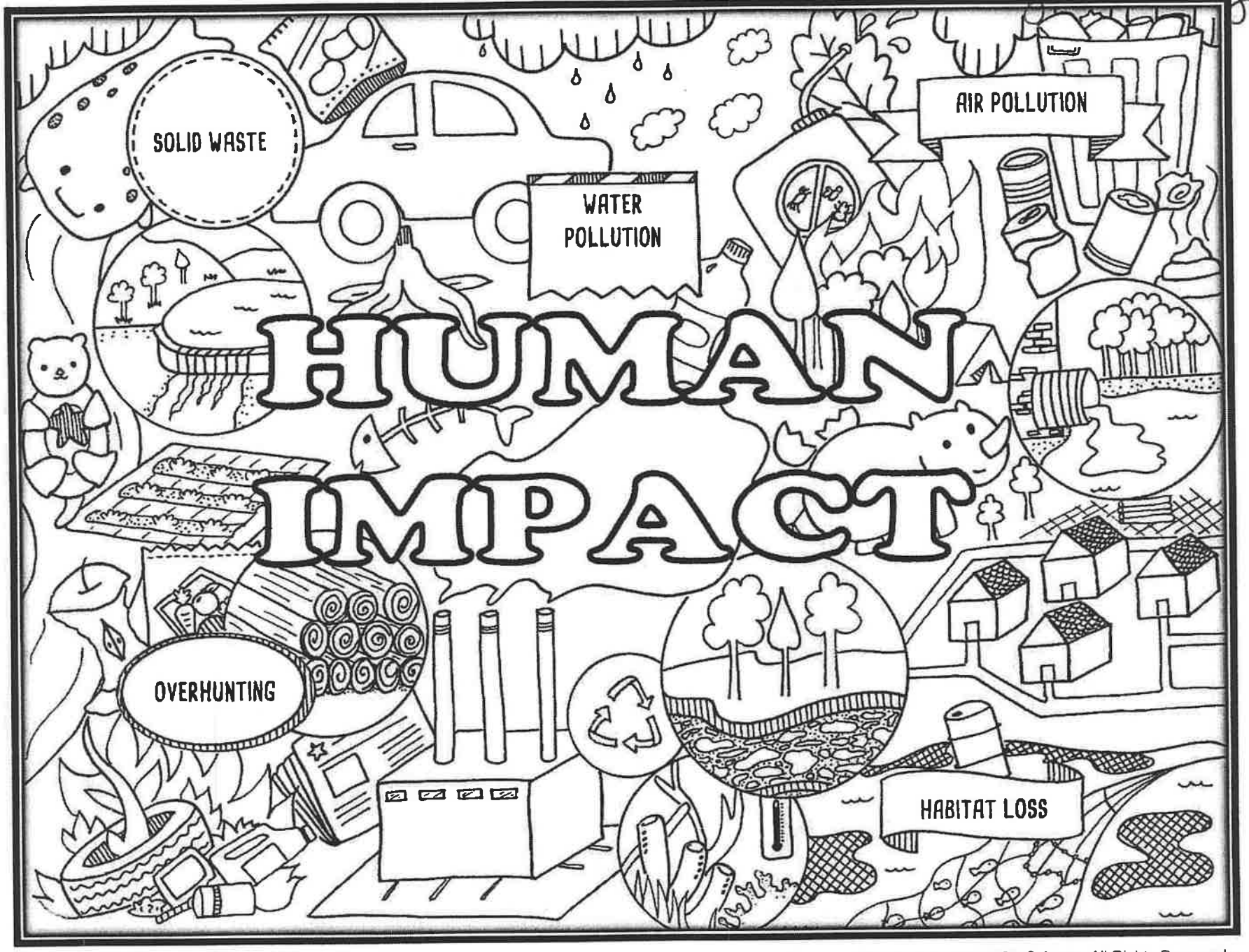
Counting Atoms and Elements Practice

	# of Atoms	# of Elements
P		
SO_4		
$3O_2$		
H_3PO_4		
$2Zn(OH)_2$		
Na_2SiO_3		
$Mg(NO_3)_2$		
$Ba_3(PO_4)_2$		

8th Grade

Day 4

7th & 8th Grades - Day 5



NAME _____ 7th/8th

Day 5

SEEK & FIND SCIENCE- HUMAN IMPACT ON THE ENVIRONMENT

SEEK & FIND

1. CAUSES OF AIR POLLUTION (3)
2. CAUSES OF WATER POLLUTION (5)
3. CAUSES OF HABITAT LOSS (5)
4. ANIMALS THAT ARE OVERHUNTED (4)
5. LANDFILL
6. RECYCLING SYMBOL
7. ITEMS THAT CAN BE RECYCLED (5)
8. ITEMS THAT CAN BE COMPOSTED (3)
9. CLEAR CUTTING
10. FOREST FIRE
11. ACID RAIN
12. HARVESTING NATURAL RESOURCE (2)
13. BURN PILE
14. OIL SPILL
15. CORAL BLEACHING
16. USES FOSSIL FUELS (3)
17. CAUSE OF ACID RAIN (3)

DEFINE KEY TERMS

- ☐ SOLID WASTE- _____
- ☐ WATER POLLUTION- _____
- ☐ AIR POLLUTION- _____
- ☐ OVER HUNTING- _____
- ☐ HABITAT LOSS- _____

COLOR & SHARE!

#SEEKANDFINDSCIENCE

Day 6 7th/8th Grades

Name_____

NEWTON'S FIRST & SECOND LAWS

Directions: Read the information below.

Newton's First Law of Motion

An object at rest will stay at rest and an object in motion will stay in motion until acted upon by an outside force. The first law of motion is all about inertia. This may seem complex, but it's actually pretty easy to understand. If you're sitting in your seat, you don't expect to start moving across the classroom. Nothing is making you move, right? You set your homework paper down on your bed and decide to go outside. When you come back in those papers should still be there. These objects (you in the chair and your homework on the bed) are at rest, meaning they are not moving. They're still. They will continue to be at rest unless something makes them move – in other words, they're acted upon by an outside force. If the wind were to blow through a window in your room, that would be a force that could move your papers. Likewise, if somebody bumped into your seat you would expect it to begin moving. No object at rest will ever being moving on its own without the help of an outside force.

Objects that are in motion will also stay in motion unless a force compels them to stop. A roller coaster may be gliding along a track, but when it reaches a hill it will slow down because the force of gravity wants to pull it back down. A football player who throws a football hopes that it will fly through the air as far as possible. However, a variety of factors including gravity and wind will act against that motion and cause the football to eventually fall. A quarterback who throws for a touchdown hopes that the football does not get acted up by the outside force of an interception, preventing it from continuing to travel down the field. A car can coast along a road, but will eventually slow down if the accelerator is not applied because of the force of friction.

Physicists like to say that objects which have a net force of 0 will have no change in motion. As you stand on the ground you exert a force on the ground, but the ground also pushes back up onto you. The two forces are equal which means there is no net force, thus the object (you) stays still. If you pushed on the ground with a greater force, then the ground would cave in downward. If the ground pushed back up on you with a greater force, then you would rise upward.

Newton's Second Law of Motion

This law states that force is equal to mass times acceleration.

Force = mass x acceleration

In other words, we know that if an object's acceleration or mass changes so will its force. It may not seem clear, but this is actually very logical. Imagine a student walking down the hall to class. Hands are empty, backpack is on. If you run into that student it would probably hurt, but not much. Now, assume that student is carrying a heavy load of books. It now requires more effort (force) for that student to maintain the same speed (acceleration) walking down the hall. That's because the mass has increased from the addition of the books. If that student was walking down the hall with empty hands again and increased his or her speed by walking faster, it would hurt more to run into them. This time it's because the acceleration increased.

If Newton's first law of motion explains how objects do not change their total net force, the second law explains how they do change their total force.

Directions: Answer the questions below.

1. If a hockey puck is traveling across the ice, it will continue moving at the same speed forever unless acted upon by an outside force. If no humans or hockey sticks touch the puck, what force might slow it down?
2. If a large and small player collide, will one or both players have a force exerted upon them? Explain your answer using Newton's Second Law of Motion.
3. The amount of force an object has is a product of what two factors?

4. A magician pretends to be able to allow an object, let's say a rabbit, float in the air with the wave of a wand. This is impossible because of Newton's laws. Use information from the text to explain what is really going on. Show your answer in words and an illustration.

Day 7 7th/8th Grades

Name_____

NEWTON'S THIRD LAW

Directions: Read the information below.

For every action there is an equal and opposite reaction. Children on a playground often have a bouncy ball to play with. When you slam a ball to the ground, it will bounce back up. The harder you push it toward the ground the farther it will travel back. The action is you pushing it to the ground, the reaction is the ball bouncing back up. If a cyclist rides his or her bicycle into a wall (we suggest you don't try this) they will not simply stop, rather you will notice they bounce back away from the wall first.

Newton's Third Law of Motion tells us that for a force in one direction, there will be an equal force in the other direction. Mathematically, we see it written as:

$$F_{AB}=-F_{BA}$$

This portion of the laws of motion explains how airplanes work. You probably understood already that airplanes don't just start rolling along a runway and suddenly lift. There's a reason that they don't simply fall out of the sky. This is because of actions and reactions. If you have ever sat in an airplane seat near the engines, you know how loud they can be. They provide a lot of force as they exert energy backward. The reaction of this is that the plane pushes forward. Rockets launch the same way. When you see a burst of fire (think: energy) pushing downward, the reaction is that the rocket will launch high up into space. The larger the action the greater the reaction.

It is important to note that we need to have the assistance of outside forces to make this possible. Recall that energy cannot be created, thus you cannot, for example, push your hands downward quickly and expect to float upward. In order to create a change in motion there will need to be a force other than yourself acting upon you.

Directions: Answer the questions below.

1. Describe an example in your own life when you have seen Newton's Third Law of Motion.

2. Use Newton's Third Law of Motion and information from the text to draw a picture that explains why airplanes do not fall out of the sky.

3. If two students are running down the hall toward each other, trying to get to class, and they have the same mass and acceleration, what will happen when they collide? Will their forces cancel out or will each one experience a reaction? Use words and a diagram or picture to explain your reasoning.

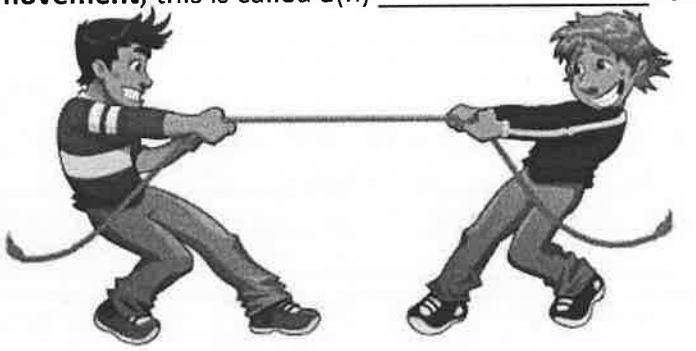
Day 8 7th/8th Grades

Name:_____

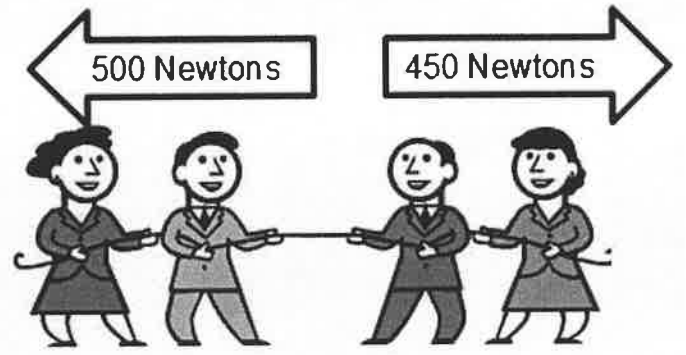
Balanced VS. Unbalanced Forces

A **force** can be a _____ or a _____. In the pictures below we see people exerting a force in one of these ways.

Sometimes there is **movement**, we called this a(n) _____ force.
Other times there is **no movement**, this is called a(n) _____ force.

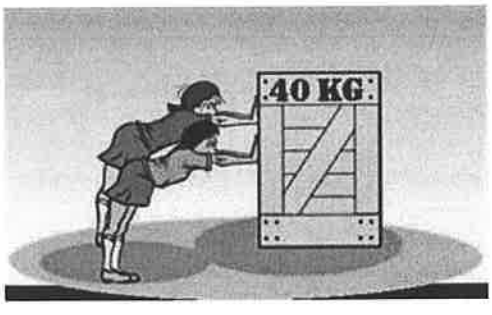


1. Is the picture above an example of pulling or pushing? _____
2. If Joey is exerting a force of 290N and Nick exerts 290N, who will win? _____
3. What is the total force applied to the rope?_____
4. Is this an example of a balanced or unbalanced force? _____



5. Above we have some teachers playing tug of war after school! Which side, left or right, will win?_____. By how much will they win?_____
6. Is this an example of a balanced or unbalanced force?_____

7. Below Sarah and Anita are pushing a crate. They both use 60N of force and the crate slowly slides. What is the total force on the crate?_____ It is *balanced/ unbalanced.*

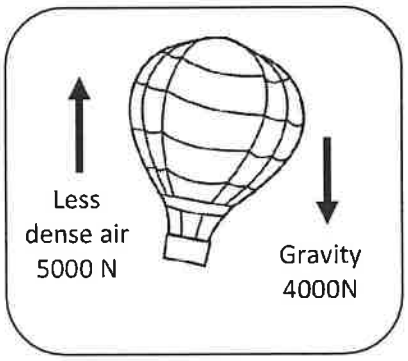


8. **WHAT IF** they both pushed on the crate and it didn't move? What would the total force on the crate be then?_____ Now it would be considered *balanced/unbalanced.*

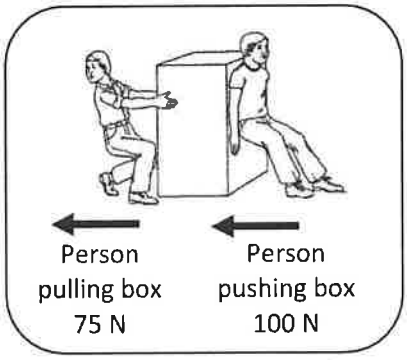
Day 9 7th/8th Grades

CALCULATING NET FORCE KEY

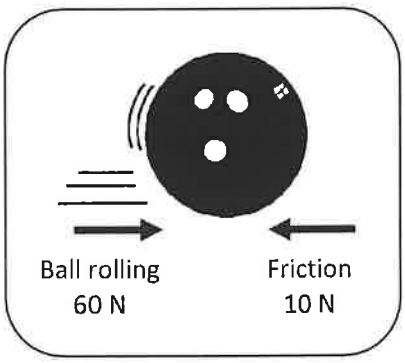
For each example, (1) identify the direction (same or opposite) that the main forces are acting on the object, (2) the method to calculate net force (add or subtract), (3) calculate the net force, and (4) identify if forces are balanced or unbalanced. Be sure to include your unit, Newtons (N).



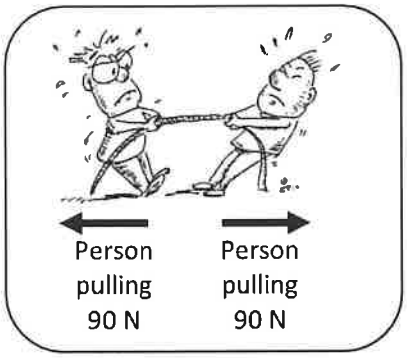
1.
2. subtract forces
3. 5000N – 4000N = 1000N
4. Unbalanced



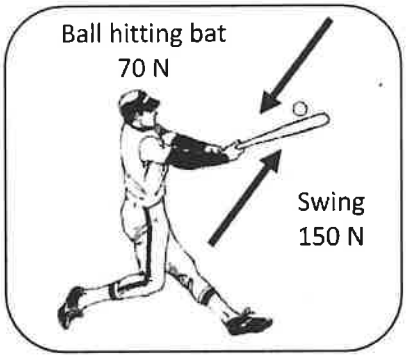
1. same directions
2. add forces
3. 75N + 100N = 175N
4.



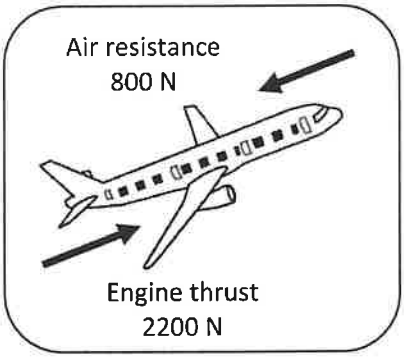
1. opposite directions
2.
3.
4. Unbalanced



1.
2. subtract forces
3. 90N – 90N = 0 N
4. Balanced



1. opposite directions
2. subtract forces
3.
4. Unbalanced



1. opposite directions
2. subtract forces
3. 2200N – 800N = 1400N
4.

4th & 8th
Grade Day 10

Make a list of all the things shown in the above picture that are not safe lab practices.