Route 22 Education

Rational Me

A one-page project featuring:

Converting Rational Numbers

Multiplying Rational Numbers

Representing Percents with Visual Representations

Why So Rational?

I was inspired to create Rational Me after watching a video about the elements present in the human body. I thought it would be great for students to learn about these elements and to calculate how much of the elements are in their own bodies. For two years, I had students create large posters to represent their results, but this year, I created a version of the project students could keep in their notebooks.

Students complete this mini-project after our lessons on rational numbers. I wanted to keep it simple and interesting. This project covers the following topics:

- Rational numbers
- Fractions
- Decimals
- Converting rational numbers
- Representing percents using circle graphs
- Representing percents using visual representations

This project includes instructions, four different types of activity pages, and an image of a completed sample. I hope your students enjoy exploring with Rational Me.

Rational Me

Materials needed: Activity pages, pencils, scale (consider allowing students to take home to measure their weights), list of six major elements in our bodies, video (optional), colored pencils or markers, example of finished product.

Hook: Did you know we really do have "fire" in our bellies? (In reality, it's an acid, hydrochloric acid, which includes one of the major elements in our bodies – hydrogen. Hydrochloric acid helps the stomach break down food). Next, I ask students to make a list of the other types of elements are in our bodies. Students then "think-pair-share" their lists before we move forward with the project introduction.

Introductory video: Nova: Hunting the Elements (2012) – The section about the elements in our human bodies begins at about 59 minutes into the program and lasts for about 8 minutes. Although the Nova presentation discusses sulfur, after additional research for the project, I decided to include calcium instead of sulfur.

Introducing Rational Me: Today, we are going to find out how much of each element we have in our bodies (some students are uncomfortable with their weights, so I give them alternative weights to use for the project. When I allowed students to take the project home, I allowed them to use the weights of parents, siblings, or other household members).

- You have the option to give student blank sheets so they can fill in the element or the amount, or you can give students activity sheets with the first two columns filled in.
- A lesson guide is included to review information with students.

Activity Pages: Allow students to choose 1 of the 4 activity pages. I highly recommend completing an example on your own to post in the classroom.

Grading: A rubric is also included with Rational Me so students will know expectations and for simplified grading.

Rational Me Lesson Guide

Part I: Review your chart. It will have 5 columns and 7 rows.

- Column one: list the elements
  (1) Oxygen – 65%, (2) Carbon – 18%, (3) Hydrogen – 10%, (4) Nitrogen – 3%, (5) Calcium – 1.5%, (6) Phosporus – 1%, (7) Trace elements – 1.5%
- Column two: percents of elements in humans
- Column three: convert percents to decimals
- Column four: amount of element in bodies based on weight (round to the nearest tenth of a percent)
- Column five: fraction form comparing element to total weight

***Even if a student weighs 100 pounds, I ask them not to use that weight to add a bit of a challenge. I use 100 pounds as I review each section of the project.

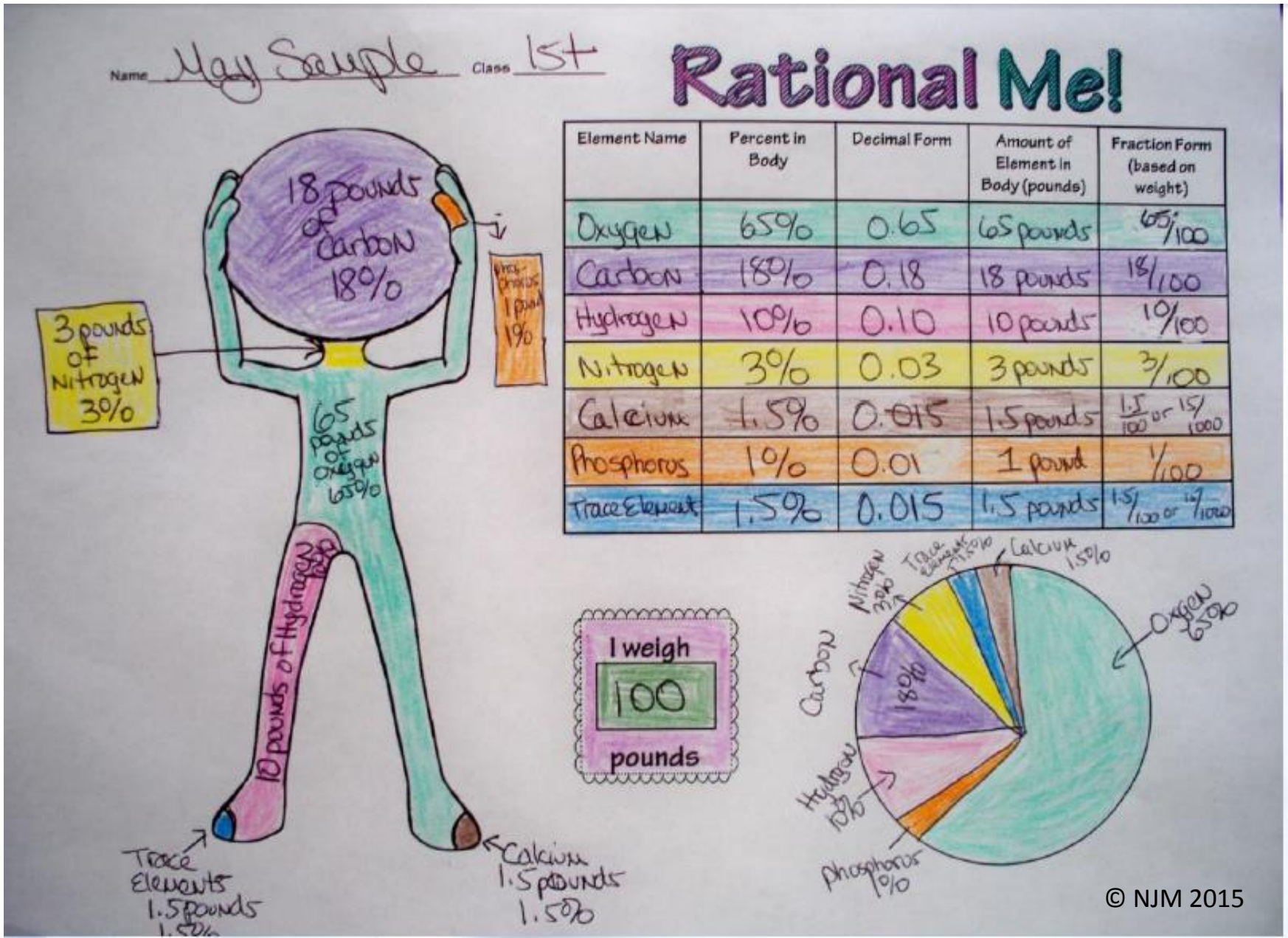
Part II: How do we find the decimal form of an element? Divide the percent by 100. Some students may know that they can omit the percent sign and move the decimal point to the left two times. The body is 65% oxygen. The decimal form of 65% is 0.65.

Part III: How do we find the amount of an element based on weight? Multiply the decimal form of each element by the total weight. Round to the nearest tenth. Multiplying 0.65 x 100 = 65 pounds of oxygen.

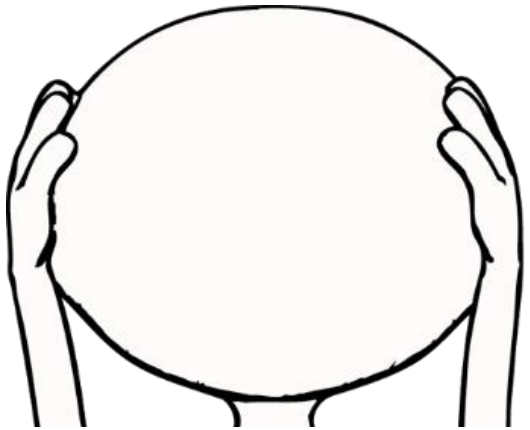
Part IV: How do we find the fraction form of the weight? To represent the part (element) over the whole (total weight), make the amount of each element in pounds over the total weight.
For example: $\frac{65}{100}$

Part V: Graphic representations – What does a circle graph represent? The "pieces" represent percents (parts of a whole). The entire circle is 100%. Students should color or shade the body shape and the circle graph to represent the amount the elements they have in their bodies.

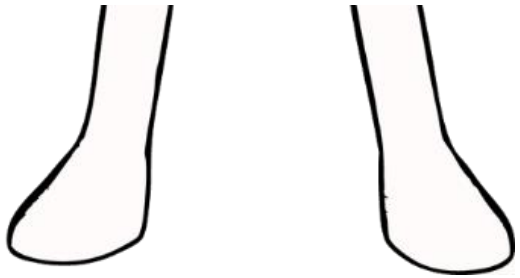
Rational Me Example



Element Name	Percent in Body	Decimal Form	Amount of Element in Body (pounds)	Fraction Form (based on weight)
Oxygen	65%	0.65	65 pounds	65/100
Carbon	18%	0.18	18 pounds	18/100
Hydrogen	10%	0.10	10 pounds	10/100
Nitrogen	3%	0.03	3 pounds	3/100
Calcium	1.5%	0.015	1.5 pounds	1.5/100 or 15/1000
Phosphorus	1%	0.01	1 pound	1/100
Trace Element	1.5%	0.015	1.5 pounds	1.5/100 or 15/1000

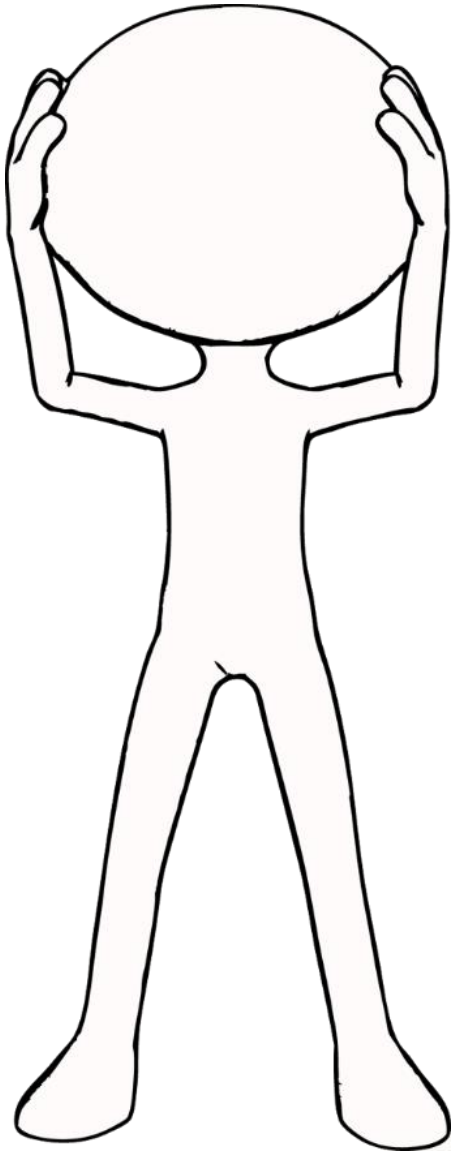


Rational Me Project Mini-Posters without Element Names and Percents Included



Name_____ Date_____

Rational Me!



Element Name	Percent in Body	Decimal form of percent	Amount of Element in Body (pounds)	Fraction Form (based on weight)

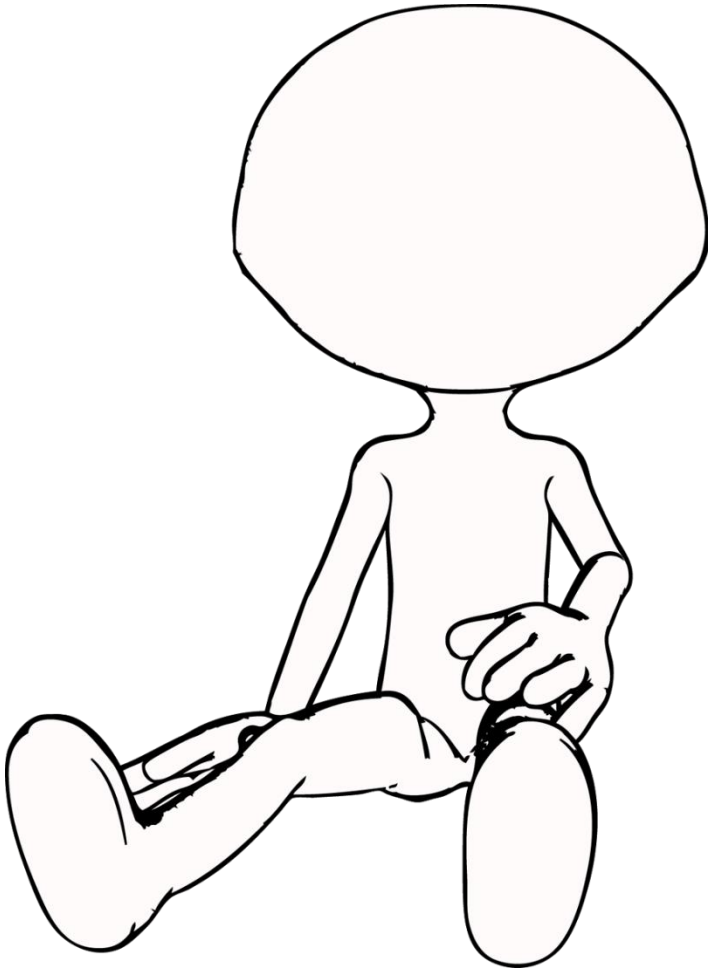
I weigh

pounds

I am made of oxygen, carbon, hydrogen, nitrogen, calcium, phosphorus, and trace elements.

Name_____ Date_____

Rational Me!



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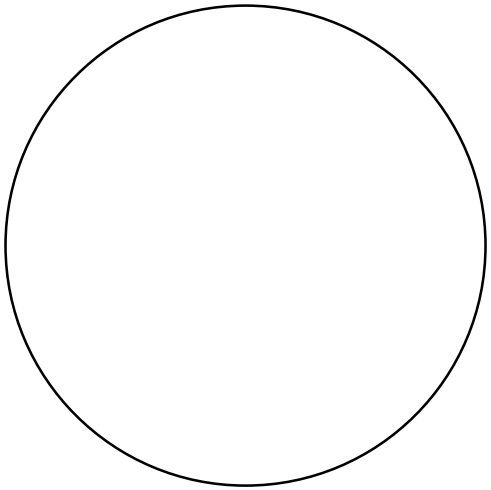

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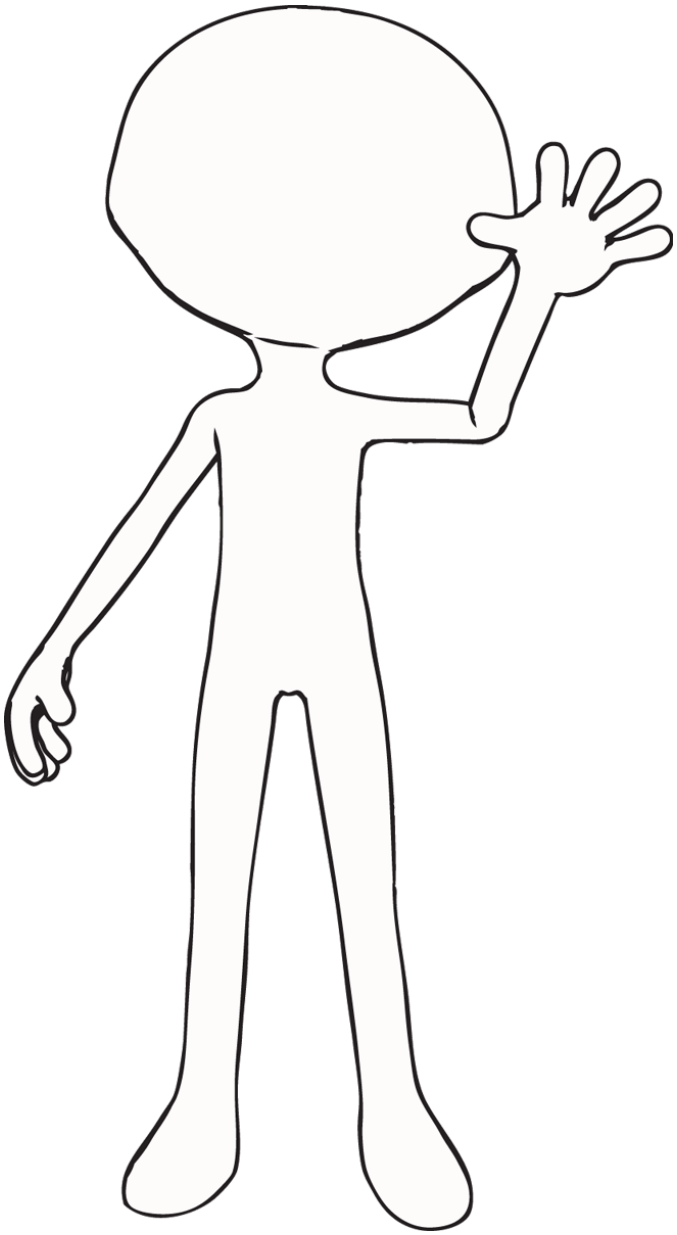

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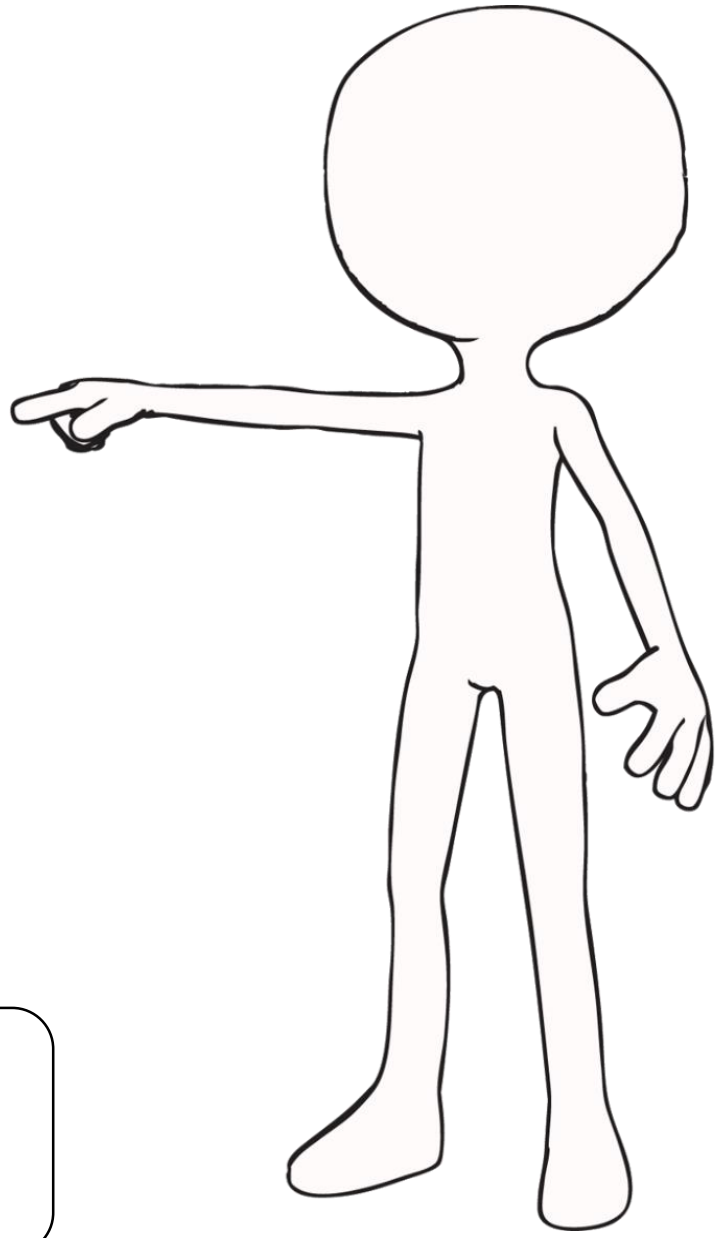

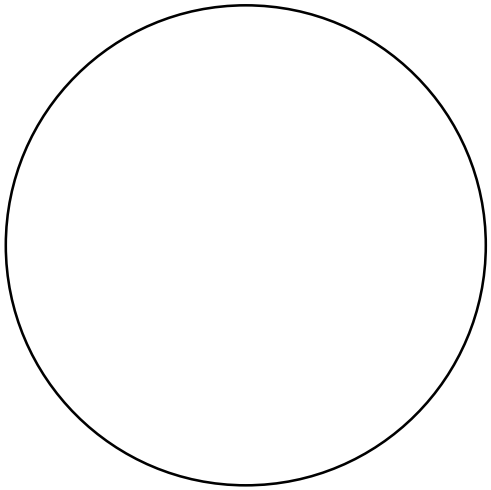

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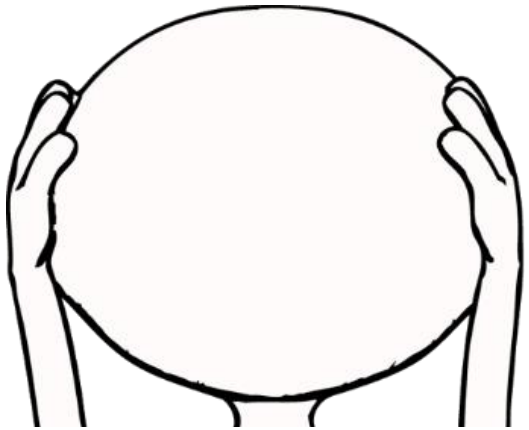

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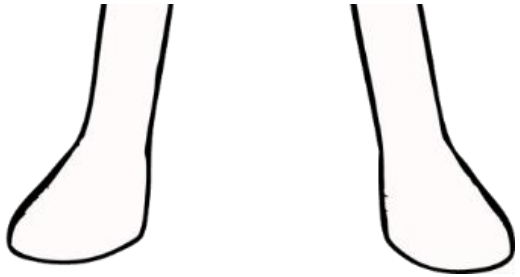
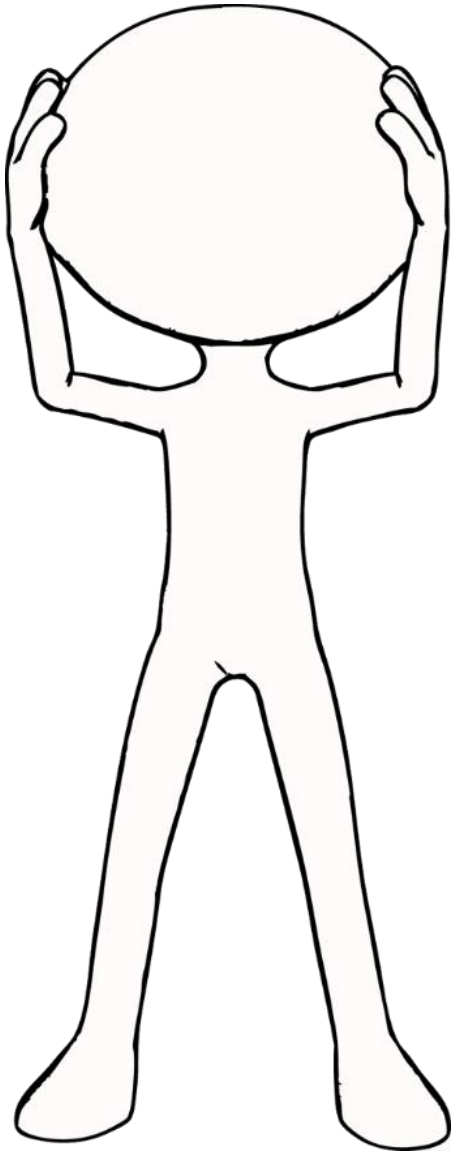


Name_____ Class _____

Rational Me!



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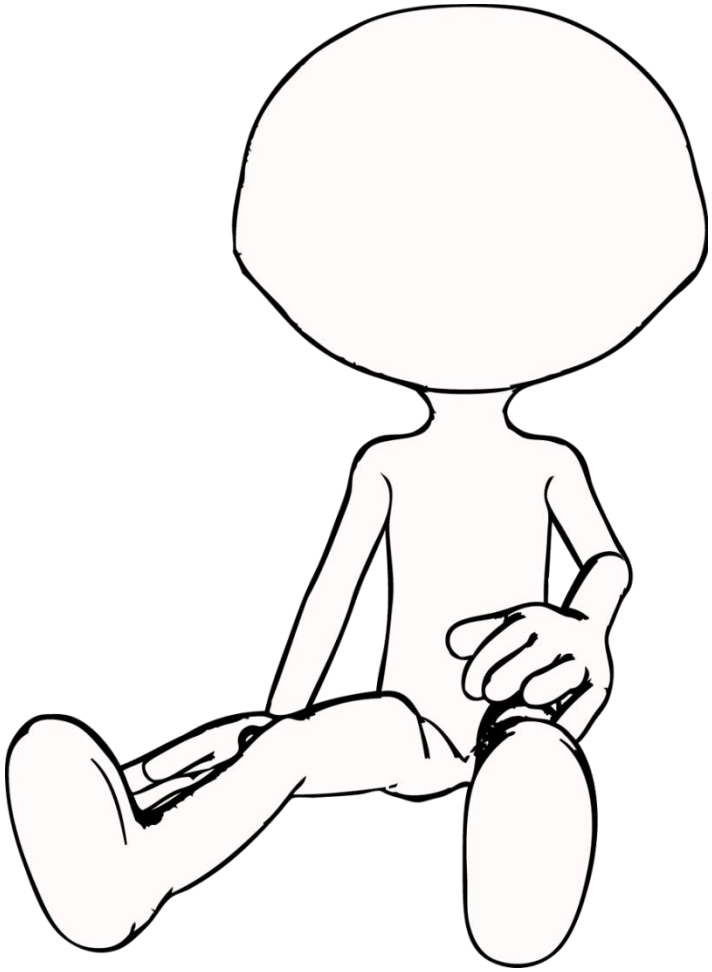

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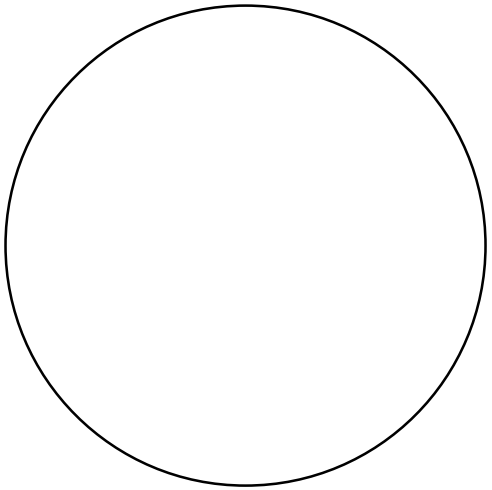

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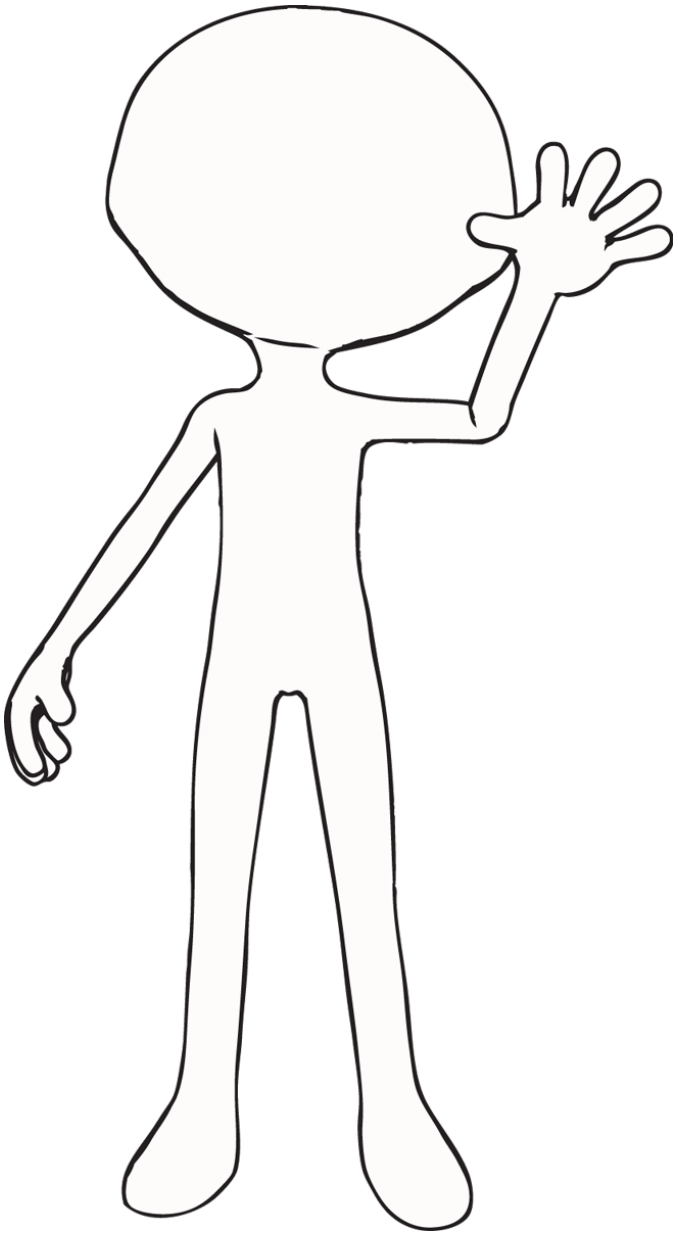

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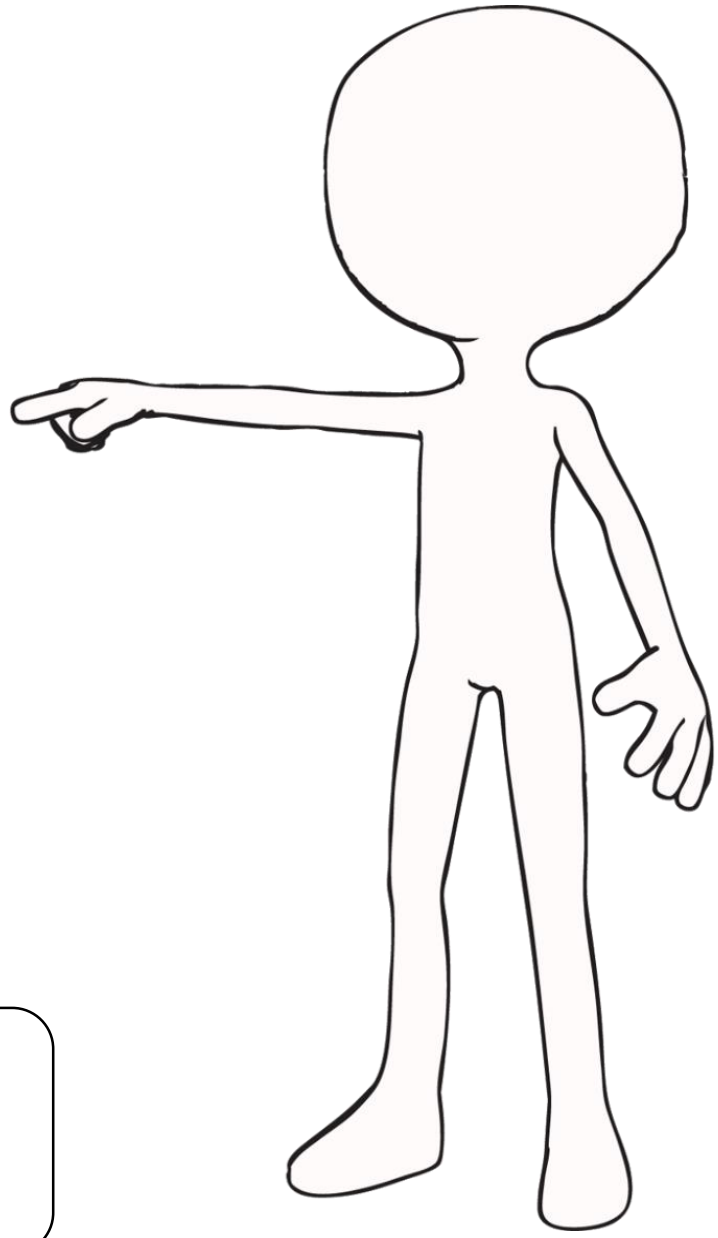

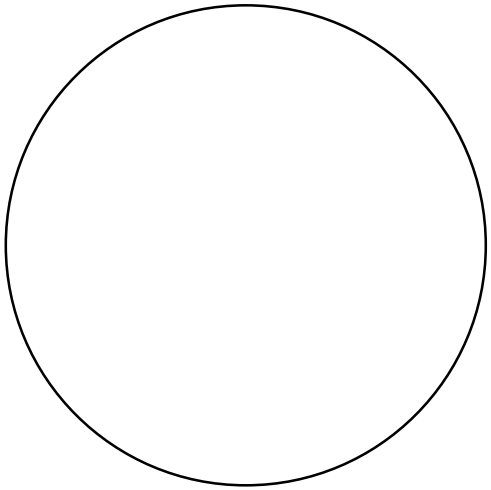

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Rational Me Rubric

Name _____ Score _____

	4	3	2	1
Convert percents to decimals	• All percents converted to decimals • No calculation errors	• All percents converted to decimals • 1-2 calculation errors	• Most percents converted to decimals • 3-4 calculation errors	• A couple or no percents converted to decimals • Major calculation errors (5 or more)
Amount of Elements in Body	• All decimals multiplied by body weight • Rounded to the nearest tenth • No calculation errors	• All decimals multiplied by body weight • Rounded to the nearest tenth • 1-2 calculation errors	• Most decimals multiplied by body weight • Rounded to the nearest tenth or whole number • 3-4 calculation errors	• A couple or no decimals multiplied by body weight • Rounded to the nearest tenth or whole number • 5 or more calculation errors
Fraction Form	• All numerators represent weights of elements in body • All denominators represent the body weight	• 5-6 numerators represent weights of elements in body • 5-6 denominators represent the body weight	• 3-4 numerators represent weights of elements in body • 3-4 denominators represent the body weight	• 2 or less numerators represent weights of elements in body • 2 or less denominators represent the body weight
Circle Graph	• Graph divided into seven sections • Percents listed in each section • Elements identified • Attention to detail evident	• Graph divided into seven sections • Percents listed in most sections • Most elements identified • Attention to detail evident	• Graph divided into 5-6 sections • Percents listed in some sections • Some elements identified • Some attention to detail evident	• Graph divided into 4 or less sections or lack of sections • Percents listed in a few sections or missing • A few elements identified • Lack of attention to detail evident
Visual Representation	• Seven identifiable sections • Percents listed in each section • Elements identified • Attention to detail evident	• Seven identifiable sections • Percents listed in most section • Most elements identified • Attention to detail evident	• Divided into 5-6 sections • Percents listed in some sections • Some elements identified • Some attention to detail evident	• Divided into 4 or less sections or lack of sections • Percents listed in a few sections or missing • A few elements identified • Lack of attention to detail evident

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	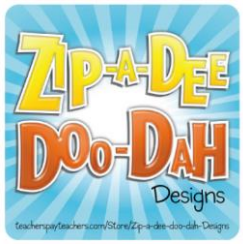	
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