

What type of energy is stored in molecular bonds?

Chemical

Mechanical (movement)

Heat

Light

What type of energy transfer would occur when food is used for energy to create movement?

Chemical ----> Kinetic (Mechanical)



How is energy stored and released in molecules?

Bonds:

Breaking: Digestion

Building bonds: Biosynthesis



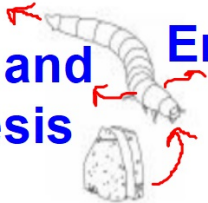
What type of energy transfer would occur when food is used for energy to keep an organism warm?

Chemical -----> Heat

Water Plants

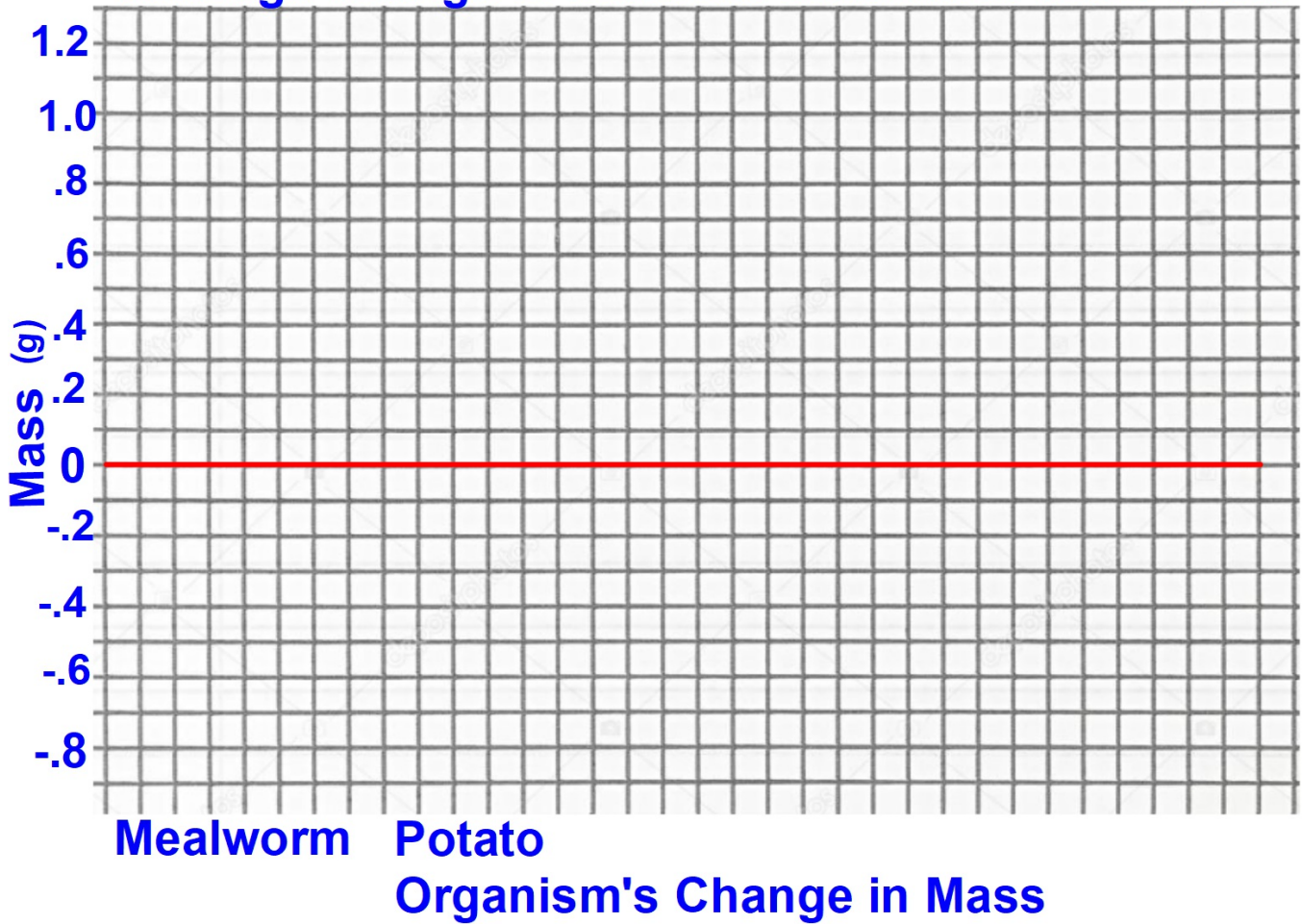


## Predictions Tool: What do you predict you will observe when mealworms eat? (Hypothesis)

Macroscopic scale: <i>Make predictions about what you will observe.</i>	Atomic-molecular scale: <i>Explain your predictions using the Three Questions.</i>						
<p><b>Predictions about mass</b> How will the movement of matter change the mass of:</p> <table border="0"> <tr> <td style="text-align: center;">the food? <i>Potato</i></td> <td style="text-align: center;">the mealworms?</td> <td style="text-align: center;">everything in the container?</td> </tr> <tr> <td style="text-align: center;">↓ <i>-.1g</i></td> <td style="text-align: center;">↑ <i>.7g</i></td> <td style="text-align: center;">→ <u>    </u></td> </tr> </table>	the food? <i>Potato</i>	the mealworms?	everything in the container?	↓ <i>-.1g</i>	↑ <i>.7g</i>	→ <u>    </u>	<p>Where will the matter in the food move to after one day? Draw labeled arrows to show how food molecules might be moving into and out of the mealworm as it eats, breathes, grows, and moves.</p> <div style="text-align: center;">  <p><b>Digestion and Biosynthesis</b>      <b>Energy: Movement and heat</b></p> </div>
the food? <i>Potato</i>	the mealworms?	everything in the container?					
↓ <i>-.1g</i>	↑ <i>.7g</i>	→ <u>    </u>					
<p><b>Predictions about changes in BTB</b> How will matter changes in this system affect CO<sub>2</sub> in the air and the color of the BTB?</p> <p>O<sub>2</sub> ↓      CO<sub>2</sub> ↑ Blue → Yellow</p>	<p>What molecules do you think are in the mealworm's food before it eats?</p> <p><b>Carbs and protein</b></p> <p style="text-align: center;">Chemical Change</p> <p>What will happen to the food molecules that the mealworm eats?</p> <p><b>Fats and Protein</b>      <b>Digestion + Biosynthesis</b> What other molecules will be involved? <b>Water and O<sub>2</sub></b></p>						
<p><b>Predictions about energy</b> What evidence of energy change will you be able to observe?</p> <p><b>Movement</b></p>	<p>What forms of energy do you think are in the mealworm's food?</p> <p><b>Carbs (chemical)</b></p> <p style="text-align: center;">Energy Transformation</p> <p>How will the energy stored in the food change after the mealworm eats?</p> <p><b>Digestion and Biosynthesis, Kinetic energy and Heat</b></p>						

Graph: Average change in Mass for Mealworms and Potato

## Average change in mass for Mealworm and Potato



Where are molecules moving? **Use the Prediction sheet to help you!!!**

Claim:	
Evidence	Reasoning

**(mass change)**

How are atoms in molecules being rearranged into different molecules?

Claim:	
Evidence	Reasoning

**(food labels)**

**(BTB)**

What is happening to energy?

Claim:	
Evidence	Reasoning

**(evidence of mealworms using energy)**

## Dried Mealworms

<b>Nutrition Facts</b>	
1 servings per container	
<b>Serving size</b>	(100g)
<b>Amount Per Serving</b>	
<b>Calories</b>	<b>440</b>
	% Daily Value*
<b>Total Fat</b> 19g	24%
Saturated Fat 4g	20%
Trans Fat 0g	
<b>Cholesterol</b> 150mg	50%
<b>Sodium</b> 180mg	8%
<b>Total Carbohydrate</b> 15g	6%
Dietary Fiber 9g	31%
Total Sugars 0g	
Includes 0g Added Sugars	0%
<b>Protein</b> 55g	110%
<b>Vitamin D</b> 0mcg	0%
<b>Calcium</b> 81mg	6%
<b>Iron</b> 4mg	20%
<b>Potassium</b> 1100mg	25%
<small>*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.</small>	

## Potato

<b>Nutrition Facts</b>	
1 servings per container	
<b>Serving size</b>	1 (148g)
<b>Amount Per Serving</b>	
<b>Calories</b>	<b>110</b>
	% Daily Value*
<b>Total Fat</b> 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 0mg	0%
<b>Total Carbohydrate</b> 26g	9%
Dietary Fiber 2g	7%
Total Sugars 1g	
Includes 0g Added Sugars	0%
<b>Protein</b> 3g	6%
<b>Vitamin D</b> 0mcg	0%
<b>Calcium</b> 26mg	2%
<b>Iron</b> 1.08mg	6%
<b>Potassium</b> 846mg	20%
<small>*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.</small>	

