Forces and Newton’s Laws
Section 2 Newton’s Laws of Motion

Objectives Read the section objectives. Then write three questions that come to mind from reading these statements.

1. 
2. 
3. 

Define acceleration to show its scientific meaning.

states that when one object exerts a force on a second object, the second object exerts a force on the first that is equal in strength and opposite in direction

is the tendency of an object to resist any change in its motion

states that an object moving at a constant velocity keeps moving at that velocity unless an unbalanced force acts on it

“The acceleration of an object is in the same direction as the net force on the object, and the acceleration can be calculated from the equation \[ a = \frac{F_{\text{net}}}{m}. \]"

Use a dictionary to define the term period.

Copyright © Glencoe/McGraw-Hill, a division of The McGraw-Hill Companies, Inc.
**Main Idea**

**Newton’s First Law of Motion**

I found this information on page __________.

**Details**

**Summarize** Newton's first law of motion by telling how an object in motion's inertia is changed and how an object at rest is affected.

Object in motion ____________________________

______________________________

Object at rest ____________________________

______________________________

**Inertia and Mass**

I found this information on page __________.

**Model** a rock being thrown at a wall and a car crashing into the wall.

**Predict** which object will do more damage, and support your answer by using the concept of inertia.

______________________________

______________________________

______________________________

**Analyze** the forces on a hockey puck sinking through water. Draw a force diagram for the puck in the water.

______________________________

______________________________

______________________________
Section 2 Newton’s Laws of Motion (continued)

**Main Idea**

**Newton’s Second Law of Motion**

I found this information on page ___________.

**Details**

**Summarize** Newton’s second law of motion in your own words.

I found this information on page ___________.

**Complete** the concept map with the 3 physical properties of an object that are related by Newton’s second law of motion.

![Concept Map]

**Organize** the 3 variables related by Newton’s second law in the table. Show equations to find each variable if you know the values of the other two variables.

<table>
<thead>
<tr>
<th>Newton’s Second Law of Motion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown Variable</td>
</tr>
<tr>
<td>Acceleration</td>
</tr>
<tr>
<td>Net force</td>
</tr>
<tr>
<td>Mass</td>
</tr>
</tbody>
</table>

**Relating Force, Mass, and Acceleration**

I found this information on page ___________.

I found this information on page ___________.

I found this information on page ___________.
Section 2 Newton’s Laws of Motion (continued)

Main Idea

Newton’s Third Law of Motion

I found this information on page ________.

Details

Summarize Newton’s third law of motion in your own words.

Predict the corresponding reaction for each action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>A high-jumper lands on a mat.</td>
<td></td>
</tr>
<tr>
<td>A fisherman tosses an anchor away from his boat.</td>
<td></td>
</tr>
<tr>
<td>An airplane’s jet engine pushes air toward the back of the airplane.</td>
<td></td>
</tr>
</tbody>
</table>

Summarize It

Summarize the relationship between a moving object’s mass, its inertia, and the forces acting on it.

__________________________________________

__________________________________________

__________________________________________

__________________________________________

__________________________________________