A car and a bus set out at 2 pm from the same spot, headed in the same direction. The average speed of the car is twice the average speed of the bus. After 2 hours, the car is 68 miles ahead of the bus. Find the rate of the bus and the car.
By the end of the period, I will apply the concept of uniform motion to solve for the desired variable in a word problem.

I will demonstrate this by completing Four-Square Notes and by solving problems in a pair/group activity.
Home Work 1-2-3: 1) Class 4-Square Notes Put In Binder?

2) Section 7.6 Pg. 415-417 TxtBk. Prob.#13,17,21,22,25 Solved and Put in Binder?

3) Section ______ Notes **Copied** on blank sheet of paper in Binder?
Storm Check (Think, Write, Discuss, Report)
Questions on which to ponder and answer:
1. How are the two images similar?
2. How are they different?
3. How can these two images be related to math?

**IMAGE 1**

A car and a bus set out at 2 pm from the same spot, headed in the same direction. The average speed of the car is twice the average speed of the bus. After 2 hours, the car is 68 miles ahead of the bus. Find the rate of the bus and the car.

```
<table>
<thead>
<tr>
<th>B</th>
<th>x</th>
<th>t = d</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2x</td>
<td></td>
</tr>
</tbody>
</table>
```
Two trains left a station in **opposite** directions. One traveled 50 miles per hour and the other traveled 45 miles per hour. **How far apart were they after 2 hours?**
Two trains left a station in **opposite** directions. One traveled **50** miles per hour and the other traveled **45** miles per hour. How far apart were they after 2 hours?

**ANSWER**

190 miles
Vocabulary

1) System of Linear Equations

2) Distance

3) Rate (Speed)

4) Time
<table>
<thead>
<tr>
<th><strong>Sketch</strong></th>
<th><strong>Friendly Definition</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>DAY 2</td>
<td></td>
</tr>
<tr>
<td>1. Review word</td>
<td></td>
</tr>
<tr>
<td>iamo</td>
<td></td>
</tr>
<tr>
<td>1. Use Visuals</td>
<td></td>
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</tr>
<tr>
<td>2. Draw a sketch</td>
<td></td>
</tr>
<tr>
<td>2. Introduce the word</td>
<td></td>
</tr>
<tr>
<td>1. Use Cognates</td>
<td></td>
</tr>
<tr>
<td>2. Physical Representation</td>
<td></td>
</tr>
<tr>
<td>3. Physical Representation</td>
<td></td>
</tr>
<tr>
<td>4. Write friendly definition</td>
<td></td>
</tr>
<tr>
<td>5. Physical Representation</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th><strong>Word List</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Wordwork</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>DAY 3 and/or DAY 4</td>
</tr>
<tr>
<td>1. Review the word</td>
</tr>
<tr>
<td>2. Synonyms/antonym</td>
</tr>
<tr>
<td>3. Related words/phrases</td>
</tr>
<tr>
<td>4. Example/non-example</td>
</tr>
<tr>
<td>1. Use Visuals</td>
</tr>
<tr>
<td>2. Physical Representation</td>
</tr>
<tr>
<td>3. Use Cognates</td>
</tr>
<tr>
<td>4. Physical Representation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Sentence</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>DAY 5</td>
</tr>
<tr>
<td>1. Review the word</td>
</tr>
<tr>
<td>2. Friendly definition</td>
</tr>
<tr>
<td>3. Physical Representation</td>
</tr>
<tr>
<td>3. Write a sentence</td>
</tr>
<tr>
<td>1. at least 2 rich words (1 action)</td>
</tr>
<tr>
<td>2. correct spelling</td>
</tr>
<tr>
<td>3. correct punctuation</td>
</tr>
<tr>
<td>4. correct subject/predicate agreement</td>
</tr>
<tr>
<td>5. clear and clean writing</td>
</tr>
</tbody>
</table>
A kayaker travels upstream at a speed of 2 miles per hour and downstream at a speed of 5 miles per hour. The speed of the current remains constant throughout the trip. **Find the speed of the kayak in still water and the speed of the current.**
A kayaker travels upstream at a speed of 2 miles per hour and downstream at a speed of 5 miles per hour. The speed of the current remains constant throughout the trip. Find the speed of the kayak in still water and the speed of the current.

\[ \begin{align*}
  x &= \text{speed of kayak} \\
  y &= \text{speed of current}
\end{align*} \]

\[ \begin{align*}
  x - y &= 2 \\
  x + y &= 5 \\
  2x &= 7 \\
  3.5 + y &= 5 \\
  y &= 1.5 \\
  x &= 3.5
\end{align*} \]

Kayak 3.5 mi/h, Current 1.5 mi/h
During a kayaking trip, a kayaker travels upstream (against the current) and downstream (with the current) at the speeds shown below. The speed of the current remains constant. Find the speed of the kayak in still water and the speed of the current.

**Upstream:** 4 miles per hour

**Downstream:** 6 miles per hour
During a kayaking trip, a kayaker travels upstream (against the current) and downstream (with the current) at the speeds shown below. The speed of the current remains constant. Find the speed of the kayak in still water and the speed of the current.

- Upstream: 4 miles per hour
- Downstream: 6 miles per hour
**Problem B**  Write and solve a linear system

**STEP 1** Write a system of equations. Let $x$ be the speed of the kayak in still water, and let $y$ be the speed of the current.

<table>
<thead>
<tr>
<th>Equation 1: Going upstream</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Speed of kayak in still water</strong></td>
</tr>
<tr>
<td>$x$</td>
</tr>
</tbody>
</table>

**Equation 2: Going downstream**

| **Speed of kayak in still water** | **+** | **Speed of current** | **=** | **Speed of kayak going downstream** |
| $x$ | $+y$ | $= |$ 6 |

**STEP 2** Solve the system of equations.

- **Write Equation 1.**
  \[ x - y = 4 \]

- **Write Equation 2.**
  \[ x + y = 6 \]

\[
\begin{align*}
2x & = 10 \\
x & = 5
\end{align*}
\]

Add equations.

- Solve for $x$.
  \[ x = 5 \]

Substitute 5 for $x$ in Equation 2 and solve for $y$.

- **Substitute 5 for $x$ in Equation 2.**
  \[ 5 + y = 6 \]

- Subtract 5 from each side.
  \[ y = 1 \]

**ANSWER** $x = 5 \quad y = 1$
Storm Check  (Think, Write, Discuss, Report)

When reading the problem, what is the first and probably most difficult step in solving a linear system of equations?
The first and most difficult step in solving a system of linear equations is ________________________
_________________________________________
_________________________________________

_________________________________________
_________________________________________

_________________________________________

_________________________________________.
**Notes:**

Distance = (Rate)(Time)

<table>
<thead>
<tr>
<th>D=RT</th>
<th>Distance</th>
<th>Rate or Speed</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Equation (East, 1&lt;sup&gt;st&lt;/sup&gt; Boat, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Equation (West, 2&lt;sup&gt;nd&lt;/sup&gt; Boat, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ D = RT \]

Distance = Speed x Time

\[ T = \frac{D}{S} \]

\[ S = \frac{D}{T} \]
A **helicopter** leaves an airport and flies north at 180 miles per hour. An hour later, an **airplane** leaves the airport flying in the same direction at 330 miles per hour. **Write a system of equations** that can be used to determine how long it will take the airplane to **overtake** the helicopter.

<table>
<thead>
<tr>
<th></th>
<th>Distance</th>
<th>Rate or Speed</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helicopter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airplane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A helicopter leaves an airport and flies north at 180 miles per hour. An hour later, an airplane leaves the airport flying in the same direction at 330 miles per hour. Write a system of equations that can be used to determine how long it will take the airplane to overtake the helicopter.

\[
y = x - 1
\]

\[
180x = 330y
\]

\[
180x = 330(x - 1)
\]

\[
180x = 330x - 330
\]

\[
-150x = -330
\]

\[
x = 2.2 \text{ h}
\]

\[
y = 2.2 - 1 = 1.2 \text{ h}
\]
STEP 2 Write a linear system. Let $x$ be the helicopter’s flying time, and let $y$ be the airplane’s flying time.

Airplane’s time $\quad = \quad$ Helicopter’s time $\quad - \quad$ One hour

$y \quad = \quad x \quad - \quad 1$

Airplane’s rate $\cdot$ Airplane’s time $\quad = \quad$ Helicopter’s rate $\cdot$ Helicopter’s time

$330 \cdot y \quad = \quad 180 \cdot x$
Suppose the airplane leaves a half hour after the helicopter. What would change in the system of equations used to determine how long it will take the airplane to overtake the helicopter.

**Original Equations**

\[
\begin{align*}
\text{Airplane’s time} &= \text{Helicopter’s time} - \text{One hour} \\
y &= x - 1 \\
330y &= 180x
\end{align*}
\]
Suppose the airplane leaves a half hour after the helicopter. What would change in the system of equations used to determine how long it will take the airplane to overtake the helicopter.

**Original Equations**

\[
\begin{align*}
\text{Airplane’s time} &= \text{Helicopter’s time} - \text{One hour} \\
y &= x - 1
\end{align*}
\]

\[
\begin{align*}
\text{Airplane’s rate} \cdot \text{Airplane’s time} &= \text{Helicopter’s rate} \cdot \text{Helicopter’s time} \\
330y &= 180x
\end{align*}
\]
Guided Practice
Two people are riding on a bicycle trail. The first person begins riding 1.2 hours before the second person. The first person is riding at 5 miles per hour. The second person is riding at 8 miles per hour. **How long will it take for the second person to overtake the first person?**

- A 1.2 hours
- B 2 hours
- C 3.2 hours
- D 16 hours
Guided Practice

Two people are riding on a bicycle trail. The first person begins riding 1.2 hours before the second person. The first person is riding at 5 miles per hour. The second person is riding at 8 miles per hour. **How long will it take for the second person to overtake the first person?**

ANSWER

B

A 1.2 hours  
B 2 hours  
C 3.2 hours  
D 16 hours
Home Work 1-2-3:

1) Class 4-Square Notes Put In Binder?

2) Section 7.6 Pg. 415-417
   TxtBk. **Prob.#13,17,21,22,25**
   **Solved** and Put in Binder?

3) Section ______
   **Notes Copied** on blank sheet of paper in Binder?

Table of Contents

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
<th>Date Due</th>
</tr>
</thead>
</table>

**Learning Target**

By the end of the period, I will apply the concept of uniform motion to solve for the desired variable in a word problem.

I will demonstrate this by completing Four-Square Notes and by solving problems in a pair/group activity.
A car was driven 312 miles at an average rate of 48 miles per hour. How long did the trip take?

Solve the linear system.

\[ 3x + 4y = 10 \]
\[ 4x + 3y = 4 \]
A car was driven 312 miles at an average rate of 48 miles per hour. How long did the trip take?

\[
\begin{align*}
3x + 4y &= 10 \\
4x + 3y &= 4
\end{align*}
\]

Solve the linear system.

ANSWER

\((-2, 4)\)

ANSWER

6.5 hours