2 cars paths

- Car A goes:
  - 60 mph for an hour
  - Takes a 15 min break
  - 30 mph for ½ hr
- Car B starts at the same place at the same time AND finishes at the same place at the same time. How fast did car B go?
- This question is the same as an easier version: ….
- Draw graphs of x-t (slope) and v-t (area)
- Discuss slope of v-t graph BRIEFLY.

Which area is bigger in the v-t graph?

0. 1. Car A
0. 2. Car B
0. 3. Same
Slope for the 3rd segment of x-t is in miles/hour

0 1. 1/2
0 2. 15
0 3. 30
0 4. None

Acceleration

- Acceleration definition:
  - changing velocity over some time interval
- Accel = ( Δ v ) / ( Δ t )
- Caused by getting pushed/pulled
- If moving one way and pushed/pulled in the same direction, the object will do what?
- If moving one way and pushed/pulled in the opposite direction, what will it do?
Make a chart – fill in based on next few clicker slides

<table>
<thead>
<tr>
<th>Direction Moving</th>
<th>Direction of push</th>
<th>Get faster, slower, stay same speed?</th>
<th>Sign of acceleration</th>
</tr>
</thead>
<tbody>
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</table>

An object is moving to the right, and is pushed to the right. What will the car do?

0  1. Speed up
0  2. Slow down
0  3. Stay same speed
0  4. Not enough info
Which direction is the acceleration?

<table>
<thead>
<tr>
<th></th>
<th>1. Right</th>
<th>2. Left</th>
<th>3. There is none</th>
<th>4. Not enough info</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
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</table>

Which sign is the acceleration?

<table>
<thead>
<tr>
<th></th>
<th>1. +</th>
<th>2. -</th>
<th>3. There is none</th>
<th>4. Not enough info</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td></td>
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</tbody>
</table>
An object is moving to the right, and is pushed to the LEFT. What will the car do?

1. Speed up
2. Slow down
3. Stay same speed
4. Not enough info

Which direction is the acceleration?

1. Right
2. Left
3. There is none
4. Not enough info
Which sign is the acceleration?

<table>
<thead>
<tr>
<th></th>
<th>1. +</th>
<th>2. -</th>
<th>3. There is none</th>
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<tbody>
<tr>
<td>0</td>
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An object is moving to the LEFT, and is pushed to the LEFT. What will the car do?

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</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Which direction is the acceleration?

0 1. Right
0 2. Left
0 3. There is none
0 4. Not enough info

Which sign is the acceleration?

0 1. +
0 2. -
0 3. There is none
0 4. Not enough info
An object is moving to the LEFT, and is pushed to the RIGHT. What will the car do?

0 1. Speed up
0 2. Slow down
0 3. Stay same speed
0 4. Not enough info

Which direction is the acceleration?

0 1. Right
0 2. Left
0 3. There is none
0 4. Not enough info
Which sign is the acceleration?

0  1. +
0  2. -
0  3. There is none
0  4. Not enough info

Review questions coming

• Similar to Quick Quiz 2 on page 31
An object is moving to the right. Which sign is its velocity?

0 1. Positive
0 2. Negative
0 3. Not enough info to answer

An object is moving to the right. Which sign is its position?

0 1. Positive
0 2. Negative
0 3. Not enough info to answer
An object is moving to the right. Which sign is its acceleration?

1. Positive
2. Negative
3. Not enough info to answer

An object is moving to the right and speeding up. Which sign is its acceleration?

1. Positive
2. Negative
3. Not enough info to answer
An object is moving to the left and speeding up. Which sign is its velocity?

0 1. Positive
0 2. Negative
0 3. Not enough info to answer

An object is moving to the left and speeding up. Which sign is its acceleration?

0 1. Positive
0 2. Negative
0 3. Not enough info to answer
Which of the following can be represented by negative acceleration for at least a moment?

0 1. Speeding up
0 2. Slowing down
0 3. Being stopped
0 4. Both 1 & 2
0 5. All of the above

What does the book say on page 29?

How many significant figures are in 7.2 mm?

0 1. 1
0 2. 2
0 3. 3
How many significant figures are in 0.72 cm?

|   |   |   |   |   |   |   |   |   |   |   |   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|   | 0 | 1 | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

How many significant figures are in 0.721 cm?

|   |   |   |   |   |   |   |   |   |   |   |   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|   | 0 | 1 | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

How many significant figures are in 0.721 cm?
How many significant figures are in 0.720 cm?

0 1. 1
0 2. 2
0 3. 3
0 4. 4

How many significant figures are in 0.00150 km? [write # on paper]

0 1. 1
0 2. 2
0 3. 3
0 4. 4
0 5. 5
0 6. 6
How many significant figures are in 1.50 m? [write # on paper]

0 1. 1
0 2. 2
0 3. 3

Calculating % errors from absolute errors (and vice versa)

\[
\% \text{error} = \frac{\text{Absolute error}}{\text{Measured or true value}} \times 100\%
\]

Example: you measure 70 ± 8 cm
Calculate: \% error = 8/70 * 100% = 11%
Correct way to write, especially for lab:
70 ± 8 cm (11%)
What is the approximate % error in 30 ± 3 cm (___%)?

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<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
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<td>3.10</td>
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What is the approximate absolute error in 30 ± __cm (20%)?

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</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.30</td>
<td>0</td>
<td>2.3</td>
<td>0</td>
<td>3.20</td>
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<td>4.0.2</td>
<td>0</td>
<td>5.6</td>
<td>0</td>
<td>6.1.5</td>
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