| Fo | rce, Ma | ass, and | I Accelei | ration | |
|--|--|--|--|---|---|
| Question: What is the relationsh | nip betwee | en force, | mass, and | accelerati | ion? |
| Thinking about force | | | | | |
| | | | | the ramp? K | leep in |
| | | | | + | |
| How will you vary the force on the car for the | his experime | ent? | · · | | |
| - | | | | | |
| | | | 1 | | |
| Measuring the force on the car | | | 9 | | |
| There are no questions to answer in part 2. | | | | 1 | |
| | | | ž. s | | |
| | | | | | |
| | | | • | | |
| | | | | | |
| | Thinking about force What are the ways you can change the amounted that force is something which has the How will you vary the force on the car for the Measuring the force on the car. There are no questions to answer in part 2. | Thinking about force What are the ways you can change the amount of force mind that force is something which has the ability to che How will you vary the force on the car for this experimental manner. Measuring the force on the car | Thinking about force What are the ways you can change the amount of force acting to pulmind that force is something which has the ability to change motion. How will you vary the force on the car for this experiment? Measuring the force on the car There are no questions to answer in part 2. | Question: What is the relationship between force, mass, and Thinking about force What are the ways you can change the amount of force acting to pull the car down mind that force is something which has the ability to change motion. How will you vary the force on the car for this experiment? Measuring the force on the car There are no questions to answer in part 2. | What are the ways you can change the amount of force acting to pull the car down the ramp? K mind that force is something which has the ability to change motion. How will you vary the force on the car for this experiment? Measuring the force on the car There are no questions to answer in part 2. |

3 Conducting the experiment

1. Follow the procedures in your Investigation guide and record your data in Table 1.

Table I: Force and acceleration at different ramp angles

| Mass | Force | Time A | Time B | Time A to B | Speed A | Speed B | Accel. |
|------|-----------|--------|------------|----------------|-------------------|------------------|-----------------------|
| (kg) | (N) | (sec) | (sec) | (sec) | (m/sec) | (m/sec) | (m/sec ²) |
| | | | | | | | |
| | | | | | | | |
| | | | -tv. sa il | | i potričini i int | the same (Marcon | |
| | 70 070 11 | | | | | | |
| | | | | | | | |
| | | | | 162 57 1 (1 | n ndrigh arts | ganuana | |
| | | | | A The party | djina i sake o | | * . |
| | | | | | | ¥ | |

| 4 | Analyzing the data |
|----|---|
| a. | List three observations you can make about the data from looking at Table 1. |
| | |
| | |
| b. | The relation between force and motion is simple but not obvious. Can you see it from the data table? Write a sentence to describe your ideas about the relationship between force and motion. |
| | |

- **a.** Circle the combination of force and mass that has been assigned to your group. The different combinations of force and mass that we will test are:
 - (1) force \div mass
 - (2) mass \div force
 - (3) force + mass
 - (4) force \times mass
- **b.** Transfer your force and acceleration data from Table 1 to Table 2 below. Add the mass data to this table. Using this data, make the calculations for your group's force and mass combination. Add these calculations to Table 2.
- c. We use graphs to find relationships. One or more of the graphs should show a pattern we can understand. If we find a pattern in the graph then we know the relationship between the variables from that graph is the one we want.
 - d. Use the data in Table 2 to make a graph that shows the relationship between force, mass, and acceleration (*your teacher will give you graph paper*). Plot your group's combination of force and mass on the *x*-axis. Plot acceleration on the *y*-axis. Be sure to give a title to your graph and label the axes.

Table 2: Force, Mass, and Acceleration Data

| a (acceleration) m/sec ² | F (force) N | m (mass of the car) kg | force and mass calculation: |
|---|-------------------|------------------------------|-----------------------------|
| runen bremit. | equitoring | Ling age of a sign of the | nine details end eller it i |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | - | | h. |
| | - | | |
| | | | |

| Examine all four graphs generated by your class. For effor the questions below: | ach, indicate a pattern, if any, that you of |
|---|--|
| force ÷ mass: Is there a pattern? If so, what is it? | 1107 + 10 II |
| | Committee of the |
| mass ÷ force: Is there a pattern? If so, what is it? | militar di sud de la racción de la companya de la c |
| The top transport (grave only 100 to | - Liter work of adapting Security of |
| force + mass: Is there a pattern? If so, what is it? | |
| | |
| force × mass: Is there a pattern? If so, what is it? | |
| | |
| Based on this experiment, what is the correct mathem | |
| Based on this experiment, what is the correct mathem | |
| Based on this experiment, what is the correct mathem | |
| Based on this experiment, what is the correct mathem | |
| Based on this experiment, what is the correct mathem | |
| Based on this experiment, what is the correct mathem | |
| Based on this experiment, what is the correct mathem | |
| Newton's second law Based on this experiment, what is the correct mathem (F), mass (m), and acceleration (a)? Write the equation | |
| Based on this experiment, what is the correct mathem | |