

MOTION AND MATTER—*Investigation 3, Part 3*

Investigation 3, Part 3:
***Investigating
Start
Position***



Teacher
Notes

Complete Teacher Notes



Investigation 3, Part 3

Start Position



I noticed some groups used different **start positions** to make their carts go different distances.

Conduct an investigation to determine how the starting position on the ramp affects how far the cart travels.

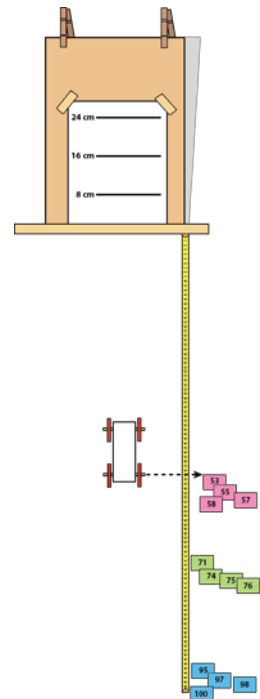
Design your own investigation and carry it out.
Don't forget to include your focus question.

You can use different color self-stick notes for each cart position.



Materials:

- Zip bag with car and miscellaneous materials
- Three colors of self-stick notes
- Ramps
- Clothespins
- Meter tapes
- Masking tape



IG pg. 193–195, Steps 1–7

Investigation 3, Part 3

Clean Up!



- Return all equipment to the materials station.
- Carefully remove the *Start Position* sheet from the cardboard ramp.
- Leave the masking tape edge on the ramp.



Teacher
Notes

IG pg. 195, Step 8

Investigation 3, Part 3

Share Investigations



What is important to remember when doing an investigation like this, where we are trying to find out the effect of one variable?

What are some things you did well in this investigation?

What are some things you might want to do differently next time you do this type of investigation?

What was the hardest part about doing this investigation?

Did you run into any problems? How did you solve them?



IG pg. 195–196, Steps 9–11

Investigation 3, Part 3

Focus Question



Write and answer your own focus question in your notebook.



What pattern did you discover in your starting position investigation?



Construct a model that explains why you think that pattern happens.

If you had a longer ramp and could start your cart at 40 cm, can you predict how far the cart might roll?

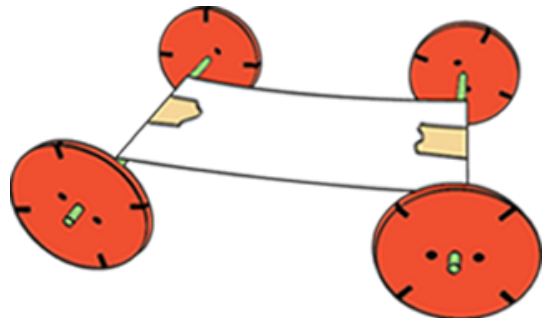


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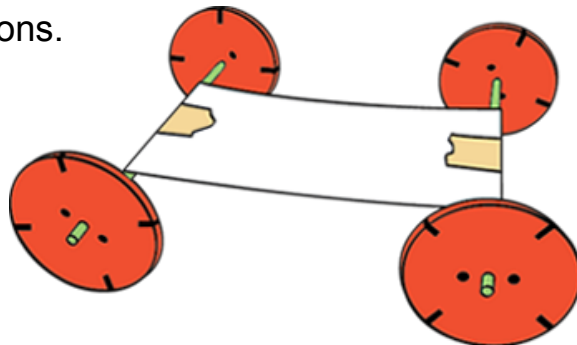
Investigation 3, Part 3

Wrap-Up/Warm-Up



Pair up with a partner to

- share and compare how you organized your data;
- compare claim and evidence statements;
- share an interesting thing you learned about science practices and controlled-variable investigations.



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Notes

IG pg. 197, Step 15

Investigation 3, Part 3

Motion and Matter

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FOSS Program Overview



MOTION AND MATTER—*Investigation 3, Part 3*

Investigation 3, Part 3: Investigating Start Position



IWB Click the *Complete Teacher Notes Button* to open the complete Teacher Notes.

IWB Click the FOSS logo to access FOSSweb.



Teacher
Notes

Complete Teacher Notes



Investigation 3, Part 2

Start Position

I noticed
to make
Conduct
position
Design
Don't
You can
cart p
Mate

- Z
- T
- R
- C
- M
- M

Motion and Matter, IG pg 193–195, Steps 1–7

Review what students did in Part 2 to modify their carts. Discuss a few of the problems they ran into and how they solved them.

Tell students you noticed a few groups seemed to be using different start positions on the ramp in order to make their carts go different distances.

Tell them they will plan and conduct an investigation to determine how the starting position on the ramp affects how far the cart travels.

Show them teacher master 15, *Start Position*, review the ramp setup, and demonstrate how to tape the sheet onto the cardboard ramp (or show them the one you taped together in Getting Ready).

Point out the three start positions on the sheet and hold up the three colors of self-stick notes. Suggest to students that they can use a different color self-stick note for each start position. When the cart comes to a stop, they can mark the location with a self-stick note.

Introduce and distribute notebook sheet 12, *Data Table*, if students wish to use it.

iwb Click the *Notebook Button* to open teacher master 15 and notebook sheet 12.

Have students plan and complete their start-position investigation.

Assess science and engineering practices progress using the "What to Look For" in Step 6.

See Step 7 if students need a few tips to complete productive investigations.

iwb Click the arrow to show an example of how students can measure the distance for each trial and start position.

Students should make a relationship claim based on the collection of their data as evidence. See the sentence starter in Step 7 if needed.

New Word Introduce *start position*.

start position: where an object begins its descent

Add the new word to the word wall.

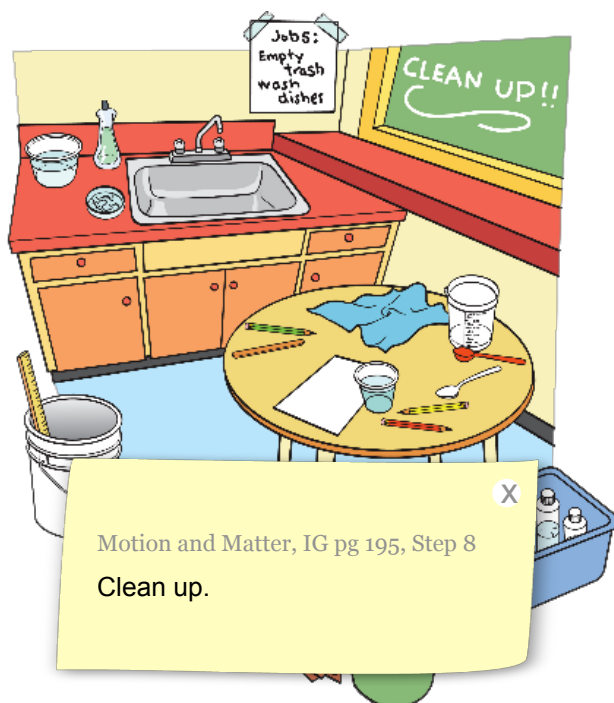
IG pg. 193–195, Steps 1–7

Investigation 3, Part 3

Clean Up!



- Return all equipment to the materials station.
- Carefully remove the *Start Position* sheet from the cardboard ramp.
- Leave the masking tape edge on the ramp.



Teacher
Notes

IG pg. 195, Step 8

Investigation 3, Part 3

Share Investigations



What is important to remember when doing an investigation like this, where we are trying to find out the effect of one variable?

What are some things you did well

What are some things you might v
next time you do this type of inves

What was the hardest part about

Did you run into any problems? H

Motion and Matter, IG pg 195–196, Steps 9–11

Have one group volunteer to share their procedure, data, claim, and evidence with the rest of the class. Have the class discuss what was done well in the investigation, then ask if they have any suggestions or different ways of doing things.

Have pairs team up with another pair and follow the same example to critique each other's procedures.

Summarize the activity by asking the questions in Step 11.

IWB You can use the *Pen Tool* to record students' responses.



IG pg. 195–196, Steps 9–11

Investigation 3, Part 3

Focus Question



Write and answer your own focus question in your notebook.



What pattern did you discover in your starting position investigation?

Construct a model that explains the pattern you think that pattern happens.

If you had a longer ramp and start your cart at 40 cm, can you predict how far the cart might travel?

Motion and Matter, IG pg 196, Step 12

Ask students to write and answer their own focus question in their notebooks, based on their self-designed investigations.

They should generate a model that explains why the higher the start position is, the farther the cart travels.

See the Teaching Note in the margin next to Step 12.

Have students discuss the questions in Step 12.

IWB You can use the *Pen Tool* to record students' responses.

See the *Home/School Connection* for Investigation 3 at the end of the Interdisciplinary Extensions section. This is a good time to send it home with students.



IG pg. 196, Step 12

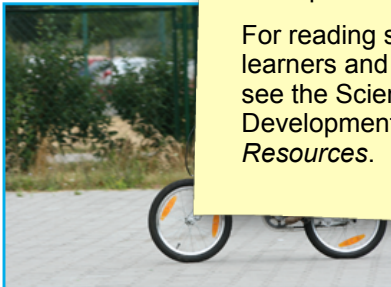
Reading in Science Resources



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Turn to page 40, "How Engineers and Scientists Work Together," in *Science Resources*. Have students read the selection as described in Step 13. Discuss the reading using the questions in Step 14.

For reading strategies to support English learners and below-grade-level readers, see the Science-Centered Language Development chapter in *Teacher Resources*.



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IG pg. 197, Steps 13–14

Investigation 3, Part 3

Wrap-Up/Warm-Up



Pair up with a partner to

- share and compare how you organized your data;
- compare claim and evidence statements;
- share an interesting thing you learned about science practices and controlled-variable investigations



Motion and Matter, IG pg 197, Step 15

Wrap-Up/Warm-Up

Conclude this part or start the next part by having students share their notebook entries with a partner.

See the Science-Centered Language Development chapter in *Teacher Resources* for suggestions for how students can share responses.



IG pg. 197, Step 15

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