

MOTION AND MATTER—*Investigation 1, Part 3*

Investigation 1, Part 3:
**More about
Forces**



Teacher
Notes

Complete Teacher Notes



Investigation 1, Part 3

Forces at Work



What do we call a push or a pull?

What force causes the paper clip to move down?



Now what forces are working to suspend, or hold,
the paper clip in the air?



Teacher
Notes

IG pg. 107, Step 1

Focus Question

➤ What causes change of motion?



IG pg. 107, Step 2

Balanced and Unbalanced Forces

The paper clip isn't moving much. When forces are working this way, we say the forces are _____.



When the forces are balanced, we don't see a change in motion.

What happens to the force of attraction between the magnet and the paper clip as I pull the paper clip farther away from the magnet?

When one force is stronger than the other, and a change of motion occurs, we say the forces are _____.



Are the forces balanced or unbalanced now?

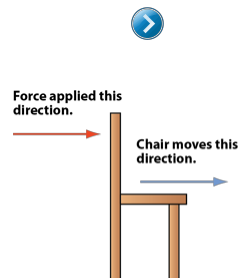


IG pg. 107–108, Step 3

Different Kinds of Force

How does the **strength** of the force affect the motion of the chair?

How does the **direction** of the force affect the motion of the chair?



The chair moves in the same direction that the force is applied.



IG pg. 108, Step 4

Identify Forces

Is force being applied to the chair?

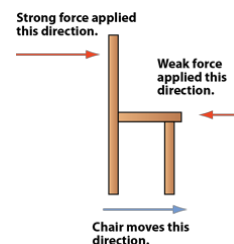
Are the forces balanced or unbalanced? What evidence do you have?

Who's pushing harder?

What's happening now? Are the forces balanced or unbalanced?

Predict which direction the chair will move if one student pushes harder than the other.

What is the effect on the chair if there is a stronger force pushing to the right?



IG pg. 108, Step 5

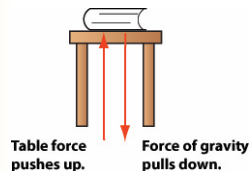
More Forces

What will the effect be if you move your arms out from under the book?

What will the effect be if you move the table out from under the book?



When the book is on a table, gravity is pulling down and the table also applies a force, pushing the book up. The forces are balanced, so the book doesn't move.



IG pg. 109, Step 6

All about Motion and Balance All about Magnets



Return to your answer to the response sheet. Discuss with a partner the important points that should be included. Revise your answer in color.



IG pg. 110, Steps 7–8

Reading in Science Resources



Table of Contents

Investigation 1: Forces

Magnetism and Gravity	3
What Scientists Do	8
Change of Motion	10



IG pg. 111–112, Steps 9–12

Vocabulary Review



IG pg. 112, Step 13

Focus Question



➤ What causes change of motion?



IG pg. 112, Step 14

Investigation 1 Vocabulary Review



magnet
push
pull
force
magnetic force

attract
repel
magnetism
gravity
model

balanced
magnetic field
evidence
change of motion
motion

data
pattern
strength
direction



IG pg. 113, Step 15

Wrap-Up



➤ What happens when magnets interact with other magnets and with paper clips?



➤ How is the magnetic field affected when more magnets are added?

➤ What causes change of motion?



IG pg. 113, Steps 16–17

Motion and Matter

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Teacher
Notes

FOSS Program Overview



MOTION AND MATTER—*Investigation 1, Part 3*

Investigation 1, Part 3:
More about Forces



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 1, Part 3

Forces at Work



What do we call a push or a pull?

What force causes the paper clip



Motion and Matter, IG pg 107, Step 1

Set up the floating paper clip system used in Part 1.




Ask the first question in Step 1.

Drop the paper clip on the string to the ground and ask the second question in Step 1.

Stick the paper clip to the magnet and pull the paper clip away from the magnet so that it is suspended in the air.

IWB Click the arrow to reveal the last question in Step 3.

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

IG pg. 107, Step 1

Focus Question



➤ What causes change of motion?



Motion and Matter, IG pg 107, Step 2

Ask students to write the focus question in their notebooks.

See some suggestions for how to proceed if students feel they already know the answer to the question.



IG pg. 107, Step 2

Balanced and Unbalanced Forces



The paper clip isn't moving much way, we say the forces are _____



Motion and Matter, IG pg 107–108, Step 3

Return to the floating paper clip system and review balanced and unbalanced forces using the text in Step 3.

Complete the first cloze sentence when the paper clip is suspended in the air.

IWB Click the arrow to reveal a summary on balanced forces.

Pull the paper clip farther away from the magnet and ask the next two questions from Step 3.

Pull the paper clip even farther away from the magnet until it falls to the floor (or desk).

IWB Click the second arrow and ask the last question in Step 3.

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



IG pg. 107–108, Step 3

Different Kinds of Force



How does the **strength** of the force affect the motion of the chair?

How does the **direction** of the force affect the motion of the chair?

Motion and Matter, IG pg 108, Step 4

Use a chair and a student volunteer to demonstrate different forces as described in Step 4.

IWB Click the arrow to reveal an image and a summary after students have answered the second question.

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

New Word Introduce *strength*.

strength: the quality of being strong

New Word Introduce *direction*.

direction: the path on which something is moving or pointing

Add all new words to the word wall.



IG pg. 108, Step 4

Identify Forces



Is force being applied to the chair?

Are the forces balanced or unbalanced?

Who's pushing harder?

Motion and Matter, IG pg 108, Step 5

Use a chair and two student volunteers to demonstrate forces as described in Step 5.

Have the two students push on opposite sides of the chair so that the chair doesn't move as you ask the first three questions in Step 5.

IWB Click the arrow to reveal the next set of questions and an image.

Have one student push harder on the chair than the other as you ask the last three questions in Step 5.

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



IG pg. 108, Step 5

More Forces



What will the effect be if you move your arms out from under the book?

What will the effect be if you m



Motion and Matter, IG pg 109, Step 6

Have students work with books from their desks to look at opposing forces as described in Step 6.

Ask the questions in Step 6.

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

IWB Click the arrow to reveal a summary of the opposing forces at work.

Discuss the experience. See the Teaching Note in the margin next to Step 6.

You can ask the optional questions at the end of Step 6 if you think students can think productively about the force of the table.



IG pg. 109, Step 6

All about M

Motion and Matter, IG pg 110, Steps 7–8

Show the video, *All about Motion and Balance*. The video can be accessed on FOSSweb, Resources by Investigation, for this module. This video defines motion and force and provides several examples.

NOTE: You must be connected to the Internet and logged into FOSSweb to access the video.

IWB Click the first arrow to access the video. You can also access the video directly via the Internet by going to <http://www.fossweb.com/video?videoID=D2881651>

Show the video, *All about Magnets*. The video can be accessed on FOSSweb, Resources by Investigation, for this module. This video reviews how magnets work and what they stick to and introduces the north and south poles. It also describes magnetic fields.

NOTE: You must be connected to the Internet and logged into FOSSweb to access the video.

IWB Click the second arrow to access chapter 2 of the video, *All about Magnets*. You can also access the video directly via the Internet by going to <http://www.fossweb.com/video?videoID=D2881646>

IWB Click the third arrow to access chapter 3 of the video, *All about Magnets*. You can also access the video directly via the Internet by going to <http://www.fossweb.com/video?videoID=D2881647>

Have students return to their answers to the response sheet in Part 2. Have them share with a partner the important points that should be included in a good answer. They can revise their answers, using the revise-with-color strategy. See Step 8 for a description of this activity.

Return to your
partner the im
your answer i



IG pg. 110, Steps 7–8

Investigation 1, Part 3

Reading in Science Resources





Table of Contents

Investigation 1: Forces

- Magnetism and G
- What Scientists D
- Change of Motion





X

Motion and Matter, IG pg 111–112, Steps 9–12

Turn to page 10, "Change of Motion," in *Science Resources*. Have students preview and read the selection as described in Step 9. Discuss the reading as described in Steps 10–12.

Create a new slide if you'd like to model how to construct a concept-definition map (Step 11).

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





Teacher Notes

IG pg. 111–112, Steps 9–12

Investigation 1, Part 3

Vocabulary Review



X



Motion and Matter, IG pg 112, Step 13

Review vocabulary.

IWB You can use the *Pen Tool* to write class definitions beside the words or use this slide as a vocabulary resource/reminder.

IWB Click each word to reveal its definition at the top of the page.

These words should find a permanent place on a word wall in your classroom so that they are always accessible to students.

Teacher Notes

IG pg. 112, Step 13

Focus Question



➤ What causes change of motion?



Motion and Matter, IG pg 112, Step 14

Ask students to answer the focus question in their notebooks.



IG pg. 112, Step 14

Investigation 1 Vocabulary Review



magnet
push
pull
force
magnetic force

attract
repel
magnetism
gravity
model

balanced
magnetic field
evidence
change of motion
motion

data
pattern
strength
direction

Motion and Matter, IG pg 113, Step 15

Review vocabulary.

Take a few minutes to review the key words developed throughout Investigation 1.

This is a good opportunity to have students make a concept map. See Step 15 for a description of this activity.



IG pg. 113, Step 15

Investigation 1, Part 3

Wrap-Up

Full Option Science System FOSS

What happens when magnets interact with other magnets and with paper clips?

How is the magnetic field affected when more magnets are added?

What causes change of motion?

Motion and Matter, IG pg 113, Steps 16–17

Conclude this Investigation by having students discuss the new words and focus questions in their groups.

Administer the I-Check.

See the Interdisciplinary Extensions following Investigation 1 for suggestions to extend learning across the curriculum.

Teacher Notes

IG pg. 113, Steps 16–17

Investigation 1, Part 3

Motion and Matter

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Motion and Matter

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Software is installed.

Teacher Notes

FOSS Program Overview

Full Option Science System FOSS