

LIVING SYSTEMS—*Investigation 1, Part 1*

Investigation 1: ***Systems***

Part 1: ***Everyday*** ***Systems***



Teacher
Notes

Overview

Complete Teacher Notes



Investigation 1, Part 1

Systems



This **system** has been designed for efficient transportation of clothes and other personal items while traveling.

What would you call a system like this?

What is a system?

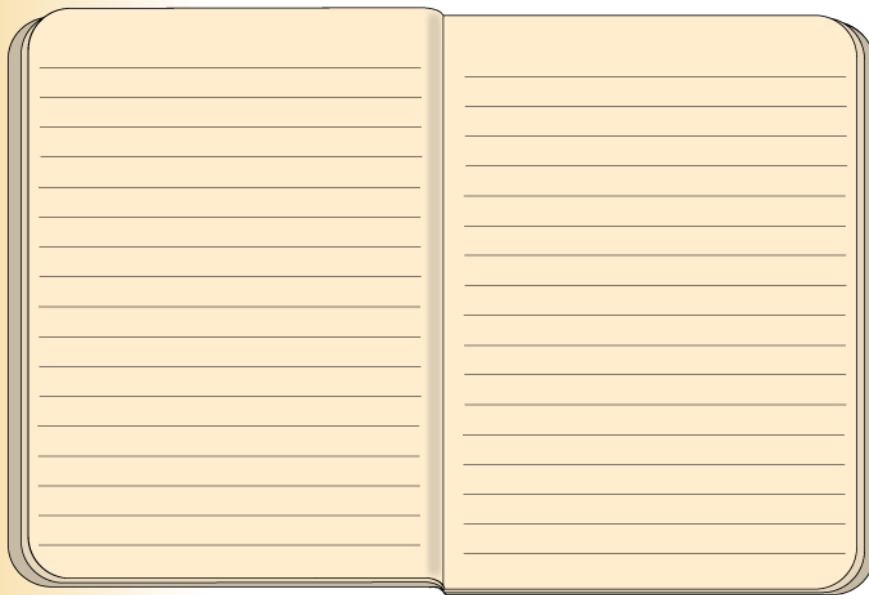


Teacher
Notes

IG pg. 93, Step 1

Investigation 1, Part 1

Science Notebook Setup



IG pg. 93, Step 2

Investigation 1, Part 1

Focus Question



➤ How can you identify a system?



IG pg. 93, Step 3

Investigation 1, Part 1

Systems



A **system** is any collection of **interacting** parts that work together to make a whole or perform a function.

What are the interacting parts that make up this suitcase and perform the function of efficient transportation of personal goods?

-



Teacher
Notes

IG pg. 93–94, Step 4

Investigation 1, Part 1

A Railroad System



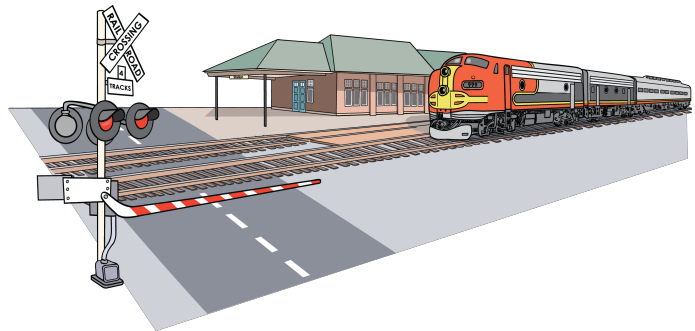
A railroad is a transportation system. Railroad systems transport people as well as heavy products going to market.

Time

Work with your group to list the important parts of a railroad system.



•



IG pg. 94–95, Step 5

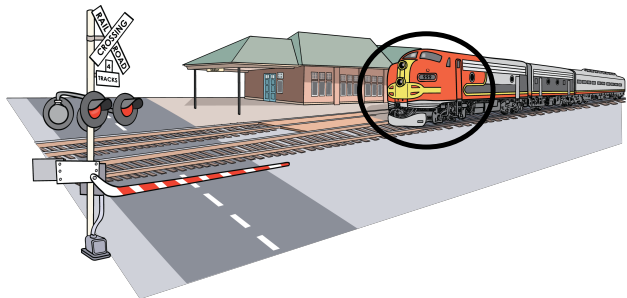
Investigation 1, Part 1

Subsystems



A system inside a larger system is a **subsystem**.

The locomotive that pulls the train is a complex system itself.



What are other subsystems found in a railroad transportation system?

-



Teacher
Notes

IG pg. 95, Step 6

Investigation 1, Part 1

System Analysis



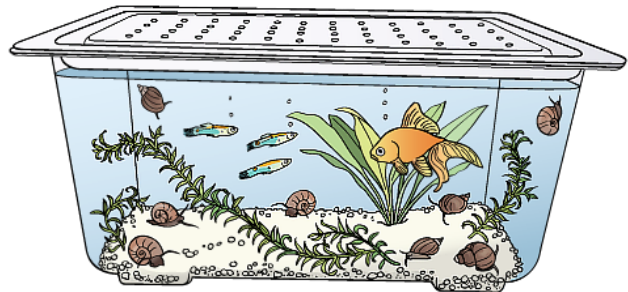
What are some other systems we can analyze?

-



In your group, analyze one of the systems.

Time



Teacher
Notes

IG pg. 95–96, Step 7

Investigation 1, Part 1

Vocabulary Review



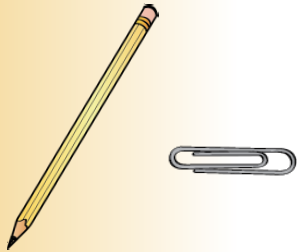
Teacher
Notes

IG pg. 96, Step 8

System Summary

Systems can be simple or complex.

simple systems



a complex system



Complex systems usually have a number of complex subsystems.



Teacher
Notes

Reading in Science Resources



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The Biosphere	7
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Comparing Aquatic and Terrestrial Ecosystems. .	16
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Teacher
Notes

IG pg. 97–98, Steps 10–11

Investigation 1, Part 1

Focus Question



➤ How can you identify a system?

Discuss the question with your group and then write a response in your notebook.



Use your notes from the reading to support your ideas.



Teacher
Notes

IG pg. 98, Steps 12–13

Investigation 1, Part 1

Wrap-Up/Warm-Up

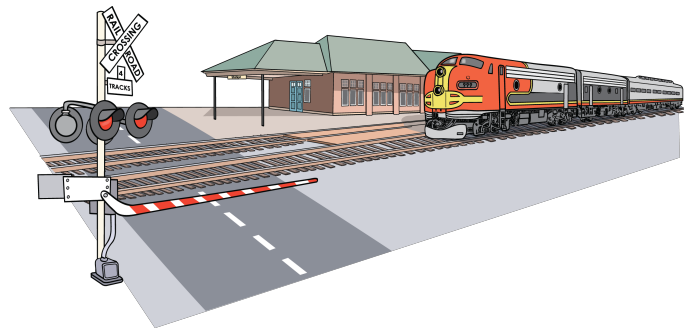


➤ How can you identify a system?



Pair up with a partner to

- share your answer to the focus question;
- discuss your understanding of *system*.



Teacher
Notes

IG pg. 99, Step 14

Investigation 1, Part 1

Living Systems

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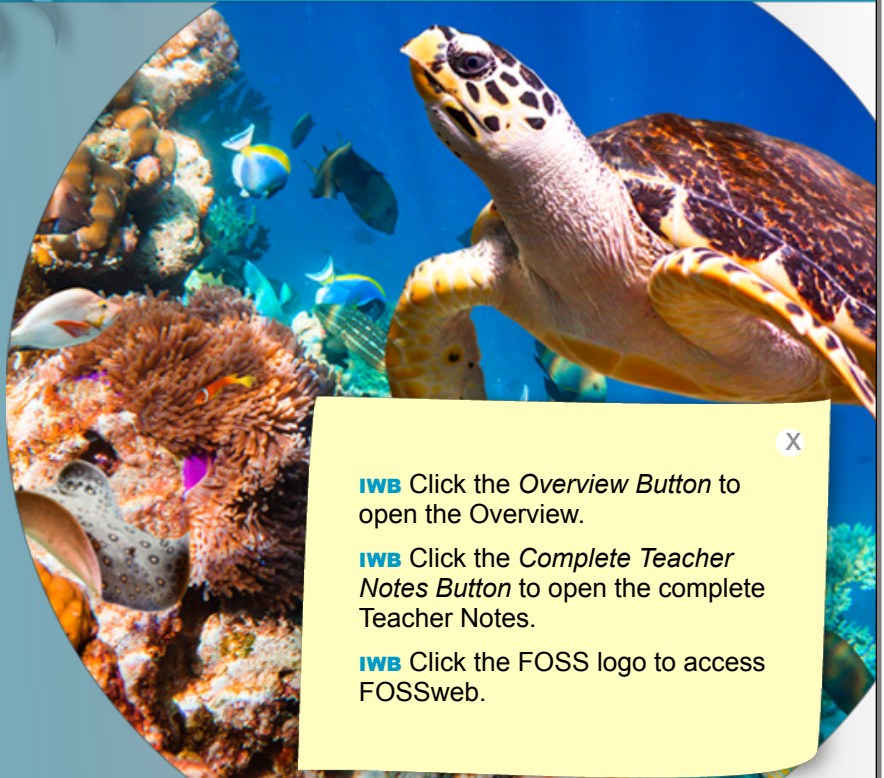
FOSS Program Overview



LIVING SYSTEMS—*Investigation 1, Part 1*

Investigation 1: ***Systems***

Part 1: ***Everyday Systems***



IWB Click the *Overview Button* to open the Overview.

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

IWB Click the FOSS logo to access FOSSweb.



Teacher
Notes

Overview

Complete Teacher Notes



Investigation 1, Part 1

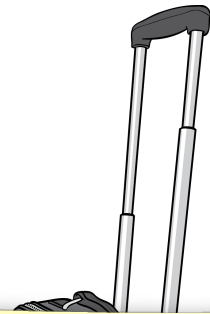
Systems



This **system** has been designed for efficient transportation of clothes and other personal items while traveling.

What would you call a system like this?

What is a system?



X

Living Systems, IG pg 93, Step 1

Show students the piece of luggage you brought in.

Introduce the idea of a system.

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

The definition for *system* will be introduced in Step 4.

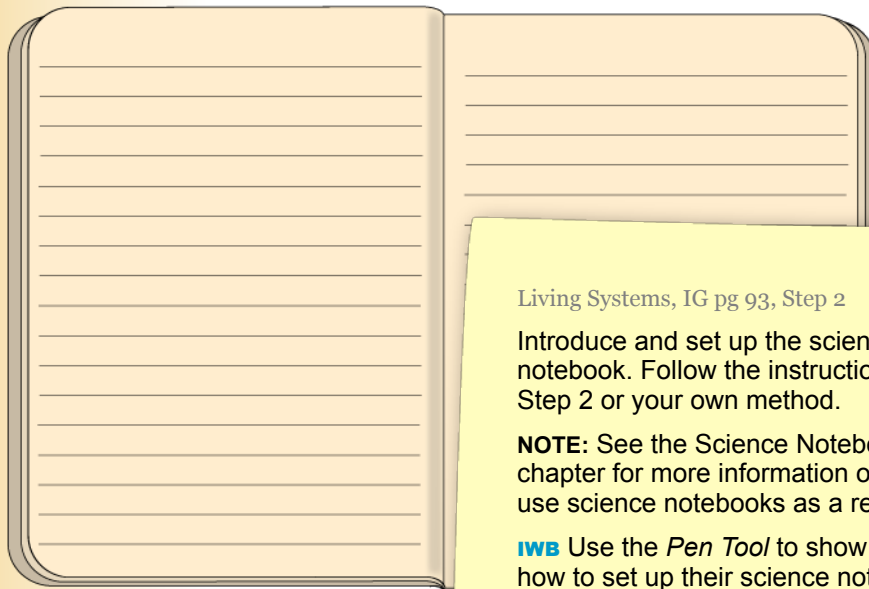


Teacher
Notes

IG pg. 93, Step 1

Investigation 1, Part 1

Science Notebook Setup



X

Living Systems, IG pg 93, Step 2

Introduce and set up the science notebook. Follow the instructions in Step 2 or your own method.

NOTE: See the Science Notebooks chapter for more information on how to use science notebooks as a resource.

IWB Use the *Pen Tool* to show students how to set up their science notebooks.



Teacher
Notes

IG pg. 93, Step 2

Investigation 1, Part 1

Focus Question



► How can you identify a system?



X

Living Systems, IG pg 93, Step 3

Ask students to write the focus question in their notebooks.



Teacher
Notes

IG pg. 93, Step 3

Investigation 1, Part 1

Systems



A **system** is any collection of parts that work together to make something function.

What are the interacting parts of the suitcase and perform the transportation of personal goods?

-

Living Systems, IG pg 93–94, Step 4

Continue to define a system.

Record students' responses. Start with the first bullet and add as students contribute. Students should identify some of the elements listed in Step 4.

Ask students to suggest missing parts or to identify items on the list that do not contribute to the intent of the system (to secure and transport personal goods efficiently).

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

New Word Introduce *system*.

system: a collection of interacting parts that work together to make a whole or perform a function

New Word Introduce *interact*.

interact: to act upon one another

Add all new words to the word wall.

X



IG pg. 93–94, Step 4

Investigation 1, Part 1

A Railroad System



A railroad is a transportation system. Railroad systems transport people as well as heavy products going to market.

Time

Work with your group to list the parts of a railroad system.

-

Living Systems, IG pg 94–95, Step 5

Turn the discussion to railroads.

Give groups 4 to 5 minutes to list the parts of a railroad system.

IWB Use the *Pen Tool* to write when you want students to finish the activity.

When students are ready, have one group read its list. Call on a student from another group to suggest one addition to the first group's list. Continue the process, giving each group an opportunity to add to or revise the class list.

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



Teacher
Notes

IG pg. 94–95, Step 5

Investigation 1, Part 1

Subsystems



A system inside a larger system is called a **subsystem**.

The locomotive that pulls the train is a complex system itself.



Living Systems, IG pg 95, Step 6

Follow the text in Step 6 to introduce subsystems. Point out that the locomotive is a subsystem of the railroad system. List (or ask for) some of the parts of the locomotive. See Step 6.

IWB Click the arrow to reveal another question.

Ask students for examples of other subsystems found in a railroad transportation system. Start with the first bullet and add as students contribute.

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

Finish the discussion by reminding students that if any part of a system is absent or breaks down, the system does not accomplish its intended task.

New Word Introduce *subsystem*.

subsystem: a system that is part of a larger system
Add the new word to the word wall.

X



Teacher
Notes

IG pg. 95, Step 6

Investigation 1, Part 1

System Analysis



What are some other systems we can analyze?

-



In your group, analyze one of the systems.

Time

Living Systems, IG pg 95–96, Step 7

Have students work in their groups to analyze another system. Write your own list on the slide (see Step 7 for a set of possibilities). Give groups about 4 to 5 minutes to work.

iWB You can use the *Pen Tool* to list the systems and assign them to groups.

iWB Use the *Pen Tool* to write when you want students to finish the activity.



Teacher Notes

IG pg. 95–96, Step 7

Investigation 1, Part 1

Vocabulary Review



Living Systems, IG pg 96, Step 8

Review vocabulary.

IWB You can use the *Pen Tool* to write class definitions beside the words or use this slide as a 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. 96, Step 8

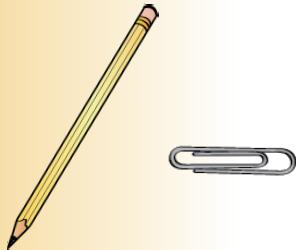
Investigation 1, Part 1

System Summary

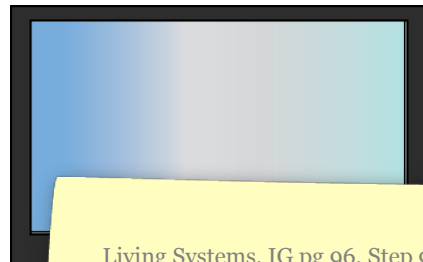


Systems can be simple or complex.

simple systems



a complex system



Complex systems usually have a number of subsystems.

Living Systems, IG pg 96, Step 9

Summarize systems with students. Tell them that systems can be simple or very complex.

Complex systems usually have lots of complex subsystems. During the rest of the module, students will look at other systems.



Teacher Notes

IG pg. 96, Step 9

Investigation 1, Part 1

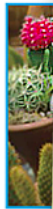
Reading in Science Resources



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Investigation 1:

Introduction to Systems
Is Earth a System?
The Biosphere . . .
Monterey Bay National
Comparing Aquatic
Nature's Recycling



Living Systems, IG pg 97–98, Steps 10–11

Give students a few minutes to look at and discuss the cover of *Science Resources*. Then have them examine and discuss the table of contents. They should also locate the glossary and index.

Turn to page 3, "Introduction to Systems," in *Science Resources*. Have students preview and read the article as described in Steps 10–11. If you choose to do the concept definition map with students, you can create a new slide or draw the chart on chart paper.

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. 97–98, Steps 10–11

Investigation 1, Part 1

Focus Question

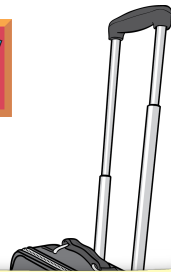


➤ How can you identify a system?

Discuss the question with your group and then write a response in your notebook.



Use your notes from the reading to support your ideas.



X

Living Systems, IG pg 98, Steps 12–13

Ask students to answer the focus question in their notebooks.

Assess progress using the "What to Look For" in Step 13.



Teacher
Notes

IG pg. 98, Steps 12–13

Wrap-Up/Warm-Up



➤ How can you identify a system?



Pair up with a partner to

- share your answer to the focus question
- discuss your understanding of systems

Living Systems, IG pg 99, Step 14

Wrap-Up/Warm-Up

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

Encourage students to provide constructive feedback to each other. See Step 14 for an example of this process.

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



Investigation 1, Part 1

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