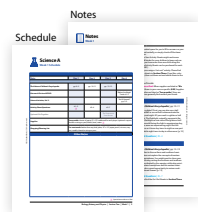


Instructor's Guide Quick Start

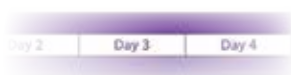
The BookShark™ Instructor's Guide (IG) is designed to make your educational experience as easy as possible. We have carefully organized the materials to help you and your children get the most out of the subjects covered. If you need help reading your schedule, see "How to Use the Schedule" in **Section Four**.

This IG includes a 36-week schedule, notes, assignments, readings, and other educational activities. For specific organizational tips, topics and skills addressed and other suggestions for the parent/teacher see **Section Three**. Here are some helpful features that you can expect from your IG.



Easy to use

Everything you need is located right after the schedule each week. If a note appears about a concept in a book, it's easy to find it right after the schedule based on the day the relevant reading is scheduled.



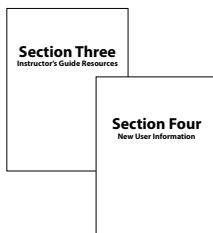
4-Day Schedule

Designed to save one day a week for music lessons, sports, field trips, co-ops, or other extra-curricular activities.

Notes

When relevant, you'll find notes about specific books to help you know why we've selected a particular resource and what we hope your children will learn from reading it. Keep an eye on these notes to also provide you with insights on more difficult concepts or content (look for "Note to Mom or Dad").

Note: What are the two kinds of poisonous lizards? The book only lists one – the Gila monster (*Hemoderm suspen-tum*) native to the southwestern United States. The other kind is known as a beaded lizard (*Hemoderm horridum*) and is found in Mexico and Guatemala. (p. 35)

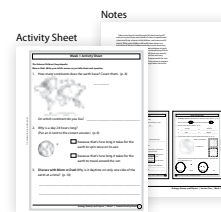


Instructor's Guide Resources and New User Information

Don't forget to familiarize yourself with some of the great helps in **Section Three** and **Section Four** so you'll know what's there and can turn to it when needed.

Activity Sheets and Answer Keys

Activity Sheets follow each week's notes and are customized for each lesson to emphasize important points in fun ways. They are designed with different skills and interests in mind. You may want to file them in a separate binder for your student's use. Corresponding Answer Keys have been included within your weekly Notes.








Science F

Week 1 Schedule

©2021 by BookShark, LLC. All rights reserved. Do not copy without written permission from BookShark, LLC

Date:	Day 1	Day 2	Day 3	Day 4	Day 5
<i>How to be Good at Science, Technology & Engineering</i>	pp. 10–13 	pp. 14–17	pp. 19–23 		
Activity Sheet Questions	#1–3	#4–8	#9–13		
Optional: Do Together			Eagle Eye		
<i>BookShark Science F Experiments Book</i>				# 1 Can You Improve a Catapult?	
Supplies	We provide (5SK): 25 popsicle sticks, 2 wide craft sticks, 2 straight straws, 2 wooden skewers, 2 rubber bands, 2 condiment cups You provide: glue gun with glue sticks, scissors, 5 mini-marshmallows or small pom-poms 				
Shopping/Planning List	For next week: 6 small bowls, 4 drinking glasses, water, marker, 8 small zip-top plastic bags, a metal spoon, 8 spoons or stir sticks, 60 mL Milk of Magnesia (about 4 Tablespoons), 1 cup vinegar				
Other Notes					

Day 1

How to be Good at Science, Technology & Engineering | pp. 10–13

Activity Sheet Questions | #1–3

Activity Sheets

Note: Find each week's Activity Sheets immediately after the notes and have your students answer the questions assigned on the schedule page. Each Activity Sheet has a corresponding Answer Key page at the end of each week's notes.

Your students do not have to do every question on the Activity Sheet. Feel free to adjust and/or omit activities to meet the needs of your students. We cover the same concepts repeatedly throughout the year (and years to come!) to enable students to learn “naturally” through repetition and practice over time.

We have provided a variety of activities to interest and challenge your students. Feel free to let your students do those activities that they enjoy and simply talk through others.

 Special Note to Mom or Dad



Notes

Week 1

Any question marked **Challenge** or **Critical Thinking** will be just that—a challenge for your students or a chance for them to think beyond the page. While we believe the material covered in the challenge questions is worthwhile for your students to know, it may not be specifically explained in their reading assignment. As always, if you think any question is too difficult for your students, please feel free to skip it.

Remember: This program is designed for you to use to meet your students' needs. It is not meant to use you!

Suggestion: Your Activity Sheets might work more easily in a small binder for your students to keep and use as assigned. If you have more than one child using this program, extra Activity Sheets can be purchased for each child (Item #5SB1).

Supplies

Note: When supplies are listed as "We provide (5SK):" they are materials found in your Science F Supplies Kit (5SK). When supplies are listed as "You provide;" they are materials you can generally find around your home.

Day 2

How to be Good at Science, Technology & Engineering | pp. 14–17

The field of engineering encompasses many more possibilities than the four traditional main types listed in the book. With advancements in technology, the field has expanded to over 40 different types of engineering majors. Engineers also work in the fields of computer, industrial, biomedical, acoustical, environmental, and nuclear engineering. Engineers solve a variety of human problems by using their knowledge and imagination to create a solution to a specific need. [pp. 16–17]

Activity Sheet Questions | #4–8

Day 3

How to be Good at Science, Technology & Engineering | pp. 19–23

Note: Animal reproduction and mating are introduced on page 21, and human reproduction will be discussed in detail later in the year.

Activity Sheet Questions | #9–13

Optional: Do Together | Eagle Eye

This week, you discussed fields of science, life, and classification. Ornithology is a branch of zoology that studies birds. Since birds are often easy to find and fun to observe, take some time this week with your students to study birds like an ornithologist might do. Spend time outside (or even inside looking out your windows) looking for birds and trying to identify them. You may have a bird handbook handy, but if not, you may be able to help your students look online for birds native to your area. Try to identify interesting characteristics of birds. You might wonder how they balance on a high wire, even while walking and pecking. You might marvel at their ability to fly. See what your students think up and research any topics of interest that develop as you watch and observe birds in your community. Please use caution and your own discretion as you look at different Internet sites with your students.

Day 4

BookShark Science F Experiments Book | #1 Can You Improve a Catapult? ■

Week 1 Activity Sheets

How to be Good at Science, Technology, & Engineering

1. Place the steps of the scientific method in the correct order by using the numbers 1–6. (pp. 10–11)

- (5) Analyze results
(3) Carry out an experiment
(6) Repeat the experiment
(1) Make an observation
(4) Collect data
(2) Form a hypothesis



2. Why do scientists share their results with other scientists? (p. 11)

(so those results can be tested repeatedly to see if they get the same results as the original scientist.)

If the hypothesis is proved correct many times, it becomes a fact



3. Match the term to its definition: (pp. 12–13)

Precise	Important changes that are measured in an experiment.
Accurate	Variables that must not change and are kept constant in an experiment.
Variables	Measurements that are correct and true to what is happening in the experiment.
Control Variables	Measurements that are very specific and consistent with each other.
Independent Variables	Errors in measurements due to user error.
Dependent Variables	Variables that are deliberately changed by the scientist during an experiment.
Bias	Variables that may change in an experiment because another variable changed. The measurement shows the results.

Week 1 Activity Sheets

4. In front of each field of study, write B if it belongs to Biology, C for Chemistry, or P for Physics. Some fields may relate to multiple groups of science. (pp. 14–15)

- (B) Plants and animals
(C) Matter
(C) Chemical reactions
(B, C, P) Earth and space
(P) Light
(B) The human body
(P) Motion
(C) Create materials
(P) Forces and energy
(B) The environment

5. **Critical Thinking:** What type of energy is illustrated by each example? (p. 15)



A steaming cup of coffee

(Heat)



A rock tumbling down a hill

(Motion)



Turning on a lamp

(Light)

6. Match the person with the description of what they do. (pp. 14–15)

Geologists	Study how atoms and molecules create substances
Medical doctors	Study cells using a microscope
Chemists	Study animals
Botanists	Study how living things interact with each other
Zoologists	Study plants
Ecologists	Study earth science
Microbiologists	Study the human body and keeping healthy
Astronomers	Study how energy affects the universe
Physicists	Study outer space



Week 1 Activity Sheets

7. Next to each option, write down the type of engineer that matches. Use Ch for Chemical Engineer, Cv for Civil, M for Mechanical, and E for Electrical. (p. 16)



- (M) Create machinery like cars and robots.
- (Ch) Help run factories that produce chemicals on a large scale.
- (E) Design electronic tools.
- (M) Requires a good knowledge of math, physics, and materials science.
- (Cv) Work with large structures like roads and bridges.
- (M) Use CAD to create models.
- (Cv) Use math and physics to ensure all of their designs are safe.
- (Ch) Can work in fields like oil refining.
- (E) Design heavy-duty machinery that generates power.

8. Place in numeric order the process engineers use to design. (p. 17)

- (3) Plan and draw out ideas, list required resources.
- (1) Ask questions to determine what problem needs to be solved and collect details.
- (4) Create a model.
- (2) Imagine possible solutions to the problem.
- (6) Present your report
- (5) Put the model to the test and make improvements.



9. List the seven characteristics of all living things: (pp. 20-21)

- 1) (eat food) 2) (gather energy) 3) (sense)
- 4) (remove waste products) 5) (move) 6) (reproduce)
- 7) (grow)



10. How do plants move? (p. 21)

(plants move by growing up and sending their roots growing down)

Week 1 Activity Sheets

11. In each blank, write the name of the kingdom or division being described. (p. 22)













- (plants) : These organisms make their own food.
- (fungi) : These organisms absorb their nutrients from dead, rotting organic matter.
- (animals) : These complex organisms have different systems that enable them to respond to changes in their environment appropriately.
- (Microorganisms) : These organisms are so small, they are often made up of just one cell and a microscope is needed to see them.



12. What is the primary difference between a vertebrate and an invertebrate? (p. 23)

(a vertebrate has a backbone and an invertebrate does not)

13. Match the species group to its key features. (p. 23)

	Amphibians		Birds	Warm-blooded with feathers that allow them to fly.
	Mollusks		Annelids	Very simple organisms that filter food from the water.
	Cnidarians		Mammals	Most have soft bodies covered with a protective shell.
	Fish		Sponges	Cold-blooded animals with moist, slimy skin that usually lay their eggs in water.
	Flatworms		Arthropods	Symmetrical bodies with stinging tentacles.
			Worms	Worms with segmented bodies.
			Insects	Cold-blooded animals with scales and gills.
			Vertebrates	Warm-blooded animals covered with fur or hair.
			Invertebrates	Worms that are flat with no segments.
			Plants	Insects with hard exoskeletons.

Week 1 Activity Sheets

How to be Good at Science, Technology, & Engineering

1. Place the steps of the scientific method in the correct order by using the numbers 1–6. (pp. 10–11)

- _____ Analyze results
- _____ Carry out an experiment
- _____ Repeat the experiment
- _____ Make an observation
- _____ Collect data
- _____ Form a hypothesis



2. Why do scientists share their results with other scientists? (p. 11)



3. Match the term to its definition: (pp. 12–13)

Precise	•	•	Important changes that are measured in an experiment.
Accurate	•	•	Variables that must not change and are kept constant in an experiment.
Variables	•	•	Measurements that are correct and true to what is happening in the experiment.
Control Variables	•	•	Measurements that are very specific and consistent with each other.
Independent Variables	•	•	Errors in measurements due to user error.
Dependent Variables	•	•	Variables that are deliberately changed by the scientist during an experiment.
Bias	•	•	Variables that may change in an experiment because another variable changed. The measurement shows the results.

Week 1 Activity Sheets

4. In front of each field of study, write B if it belongs to Biology, C for Chemistry, or P for Physics. Some fields may relate to multiple groups of science. (pp. 14–15)

_____ Plants and animals

_____ Matter

_____ Chemical reactions

_____ Earth and space

_____ Light

_____ The human body

_____ Motion

_____ Create materials

_____ Forces and energy

_____ The environment

5. **Critical Thinking:** What type of energy is illustrated by each example? (p. 15)



A steaming cup of coffee



A rock tumbling down a hill



Turning on a lamp

6. Match the person with the description of what they do. (pp. 14–15)

Geologists •

• Study how atoms and molecules create substances

Medical doctors •

• Study cells using a microscope

Chemists •

• Study animals

Botanists •

• Study how living things interact with each other

Zoologists •

• Study plants

Ecologists •

• Study earth science

Microbiologists •

• Study the human body and keeping healthy

Astronomers •

• Study how energy affects the universe

Physicists •

• Study outer space



Week 1 Activity Sheets

7. Next to each option, write down the type of engineer that matches. Use Ch for

Chemical Engineer, Cv for Civil, M for Mechanical, and E for Electrical. (p. 16)

- _____ Create machinery like cars and robots.
- _____ Help run factories that produce chemicals on a large scale.
- _____ Design electronic tools.
- _____ Requires a good knowledge of math, physics, and materials science.
- _____ Work with large structures like roads and bridges.
- _____ Use CAD to create models.
- _____ Use math and physics to ensure all of their designs are safe.
- _____ Can work in fields like oil refining.
- _____ Design heavy-duty machinery that generates power.



8. Place in numeric order the process engineers use to design. (p. 17)



- _____ Plan and draw out ideas, list required resources.
- _____ Ask questions to determine what problem needs to be solved and collect details.
- _____ Create a model.
- _____ Imagine possible solutions to the problem.
- _____ Present your report
- _____ Put the model to the test and make improvements.

9. List the seven characteristics of all living things: (pp. 20–21)

- 1) _____ 2) _____ 3) _____
- 4) _____ 5) _____ 6) _____
- 7) _____



10. How do plants move? (p. 21)

Week 1 Activity Sheets

11. In each blank, write the name of the kingdom or division being described. (p. 22)

_____ : These organisms make their own food.

_____ : These organisms absorb their nutrients from dead, rotting organic matter.

_____ : These complex organisms have different systems that enable them to respond to changes in their environment appropriately.

_____ : These organisms are so small, they are often made up of just one cell and a microscope is needed to see them.



12. What is the primary difference between a vertebrate and an invertebrate? (p. 23)

13. Match the species group to its key features. (p. 23)



Amphibians

•

• Warm-blooded with feathers that allow them to fly.



Mollusks

•

• Very simple organisms that filter food from the water.



Cnidarians

•

• Most have soft bodies covered with a protective shell.



Birds

•

• Cold-blooded animals with moist, slimy skin that usually lay their eggs in water.



Annelids

•

• Symmetrical bodies with stinging tentacles.



Mammals

•

• Worms with segmented bodies.



Sponges

•

• Cold-blooded animals with scales and gills.



Arthropods

•

• Warm-blooded animals covered with fur or hair.



Fish

•

• Worms that are flat with no segments.



Flatworms

•



• Insects with hard exoskeletons.



Science F

Week 2 Schedule

©2021 by BookShark, LLC. All rights reserved. Do not copy without written permission from BookShark, LLC

Date:	Day 1	Day 2	Day 3	Day 4	Day 5
<i>How to be Good at Science, Technology & Engineering</i>	pp. 24–27 	pp. 28–33 	pp. 34–37		
Activity Sheet Questions	#1–5	#6–12	#13–18		
Optional: Do Together			Best Breath		
<i>BookShark Science F Experiments Book</i>				#2 How do You Know Antacids Work?	
Supplies	We provide (5SK): masking tape, 4 Tums tablets, 2 Pepcid tablets, 4 Alka-Seltzer tablets, 10 pH testing strips with key You provide: 6 small bowls, 4 drinking glasses, water, marker, 8 small zip-top plastic bags, a metal spoon, 8 spoons or stir sticks, 60 mL Milk of Magnesia (about 4 Tablespoons), 1 cup vinegar				
Shopping/Planning List	For next week: 1 disposable water bottle with lid (about 11-20 oz), 5 oz baby oil, water, 5 drops red food coloring, 1 oz vegetable oil, timer				
Other Notes					

Day 1

How to be Good at Science, Technology & Engineering | pp. 24–27

Note: On page 26, the book introduces the cells related to human reproduction.

Activity Sheet Questions | #1–5

Day 2

How to be Good at Science, Technology & Engineering | pp. 28–33

Note: On pages 30–31, the book covers the human digestive system. The suggested book activity may lead to potty humor.

Have you ever wondered how long it takes for the food you eat to move through all the stages of your digestive system? It depends on the type of food you eat. Some foods like fruits and vegetables move through quickly

 Special Note to Mom or Dad



Notes

Week 2

while other foods containing fats and proteins take longer to break down. Therefore, the length of time from your first bite until your body has digested the food varies between 24 to 72 hours, with 36 hours being the average amount of time. [pp. 30–31]

Activity Sheet Questions | #6–12

Day 3

How to be Good at Science, Technology & Engineering | pp. 34–37

Activity Sheet Questions | #13–18

Optional: Do Together | Best Breath

Today, spend some time with your students talking about the practical aspects of breathing and respiration. Breathing is so natural that we often do not spend any time thinking about the best way to breathe in different situations. Do your students notice a difference in the way they breathe when sitting still versus when they

are playing or running? Diaphragmic breathing is the best way to breathe because it encourages full oxygen exchange for optimal intake of oxygen and the release of carbon dioxide. Even though you naturally know how to breathe using your diaphragm, sometimes you resort to chest breathing which produces more shallow breathing. Explore diaphragmic breathing with your students. One way to do this is by lying on your back and placing your hand on your stomach. Breathe in through your nose, pulling air deep into your lungs by expanding your abdomen. Hold for a moment, then release the air slowly through your mouth. You will feel your abdomen returning to its original position. Practice diaphragmic breathing for a few minutes. Refer back to pages 36–37 and talk about how diaphragmic breathing makes you feel and why it is important.

Day 4

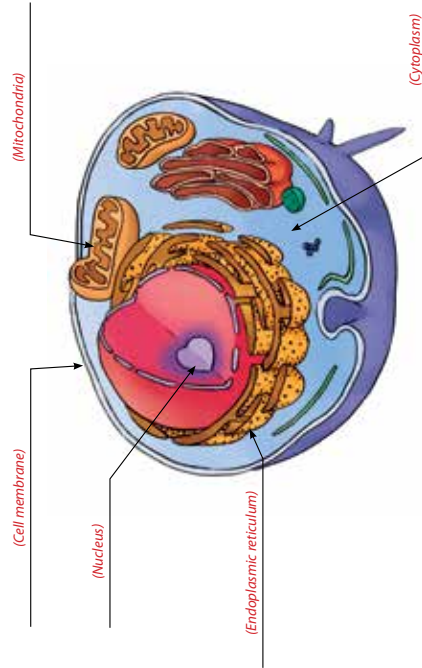
BookShark Science F Experiments Book | #2

How do You Know Antacids Work? ■

Week 2 Activity Sheets

How to be Good at Science, Technology, & Engineering

1. Label the parts of the animal cell. (p. 24)



2. Match the organelle with its function by placing the correct letter in the blank. (p. 24)

- (E) The jellylike substance that the organelles sit in.
 (D) This outer layer keeps water from leaking through.
 (C) These folded tubes and sacs make proteins.
 (B) These provide the cell with power.
 (A) The set of instructions, DNA, is found here.
- A. Nucleus
 B. Mitochondria
 C. Endoplasmic reticulum
 D. Cell membrane
 E. Cytoplasm



3. How can you tell just by looking at the image of the cell to the right that it is a plant cell? (p. 25)
 (It has a cell wall and a vacuole)

Week 2 Activity Sheets

4. Write the correct term in front of the definition. (pp. 26-27)

- (Cells) : Units that come in different shapes and types to perform specific tasks.
 (Organ systems) : A collection of organs that work together.
 (Tissues) : Cells that collect in layers.
 (Organs) : Various tissues that combine to perform a large task.



5. Name three different types of organ systems. (p. 27)

(answers may include digestive, muscular, nervous, or respiratory systems)

6. Match the nutrient with the food that provides it. Hint: Some foods provide more than one kind of nutrient. (pp. 28-29)

Proteins

Carbohydrates

Lipids

Vitamins

Minerals

Fiber



broccoli



white bread



steak

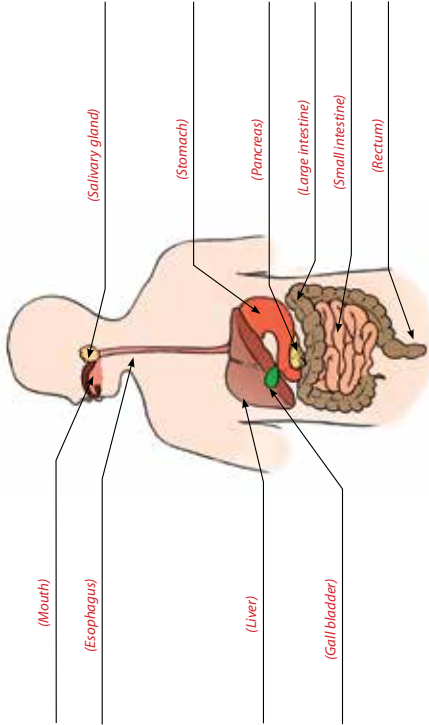


olive oil

Week 2 Activity Sheets

7. Label the parts of the digestive system using the terms in the box. (p. 30)

Esophagus	Liver	Small intestine	Pancreas	Stomach
Gall bladder	Rectum	Large intestine	Mouth	Salivary gland



8. Match the function with the correct organ. (p. 30)

Protein digestion begins here.

Food is mashed up and moistened.

Because this organ has a huge surface area, food particles can be absorbed into the blood.

This tube connects the mouth with the stomach and uses peristalsis to push it downward.

Excess water is reabsorbed here and feces are able to leave the body.

~~Small intestine~~

Stomach

Esophagus

Mouth

Large intestine

Week 2 Activity Sheets

9. Circle the correct answer. Enzymes are very specific and only target certain food molecules to break their nutrients into small pieces for the body to absorb. (p. 31)

True

False

10. Label the types of teeth using the terms in the box below. (p. 32)

Canines

Molars

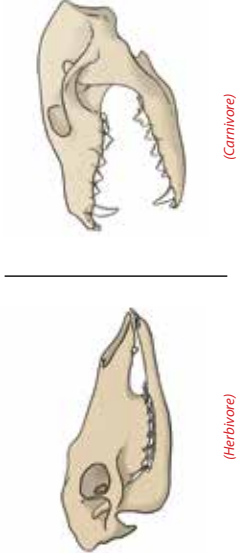
Incisors

Premolars

11. Complete the chart by placing the function of each type of tooth under the name. (p. 32)

Name of Tooth	Incisors	Canines	Premolars	Molars
Function of Tooth	(To cut food)	(Grip and tear)	(Grind)	(Crunch and grind)

12. Write either **carnivore** or **herbivore** on the lines below to label which kind of animal each skull belongs to. (p. 33)



(Herbivore)

(Carnivore)

Week 2 Activity Sheets

13. Explain how oxygen gets from the air we breathe to a muscle cell. (p. 34)

(4) _____ Oxygen is transported to the muscle via hemoglobin in the blood vessels.

(1) _____ Oxygen enters through the mouth or nose and moves into the lungs.

(2) _____ Oxygen is transferred into the blood.

(3) _____ Carbon dioxide, the waste product of respiration, is transferred into the lungs and breathed out.



14. Circle the correct word to complete the statement.

Aerobic

respiration uses oxygen

to release energy. (pp. 34-35)

15. Match the type of respiration with the correct plant or animal. (p. 35)

Birds

Filaments in gills have blood vessels that absorb the oxygen.

Mammals

Stomata open and close to allow gases to come in and out.

Fish

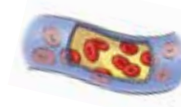
Air travels only in one direction moving to air sacs located all over the body.

Insects

Oxygen inhaled and carbon dioxide is exhaled.

Plants

Spiracles on the side of the body lead to tiny tubes called tracheae.



©2021 by BookShark, LLC. All rights reserved. Do not copy without written permission from BookShark, LLC

Week 2 Activity Sheets

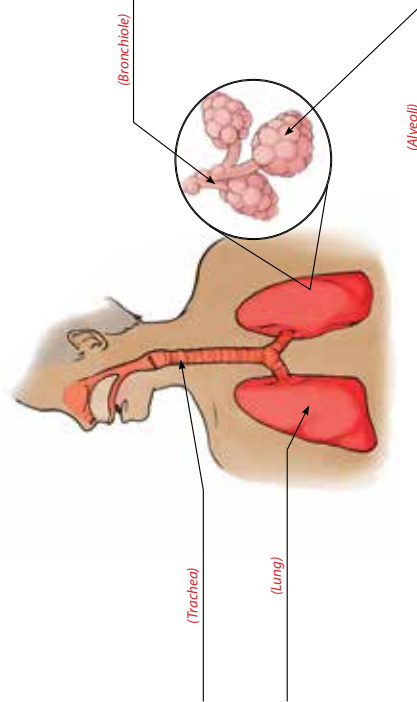
16. Use the terms in the box to label the diagram. (p. 36)

Trachea

Bronchiole

Lung

Alveoli



17. Number the steps of how a person breathes. (pp. 36-37)

(3) _____ Air moves into bronchioles then into alveoli.

(1) _____ The diaphragm muscle moves down as the rib cage moves up. The lungs expand.

(5) _____ Carbon dioxide waste moves from the blood through the alveoli to be breathed out.

(2) _____ Air is pulled in, moving down the trachea.

(4) _____ Oxygen passes through the alveoli walls to diffuse into the blood.

(6) _____ The diaphragm moves up, squeezing the lungs and expelling the carbon dioxide through the trachea.



18. Why does asthma make it more difficult for people to breathe? (p. 37)

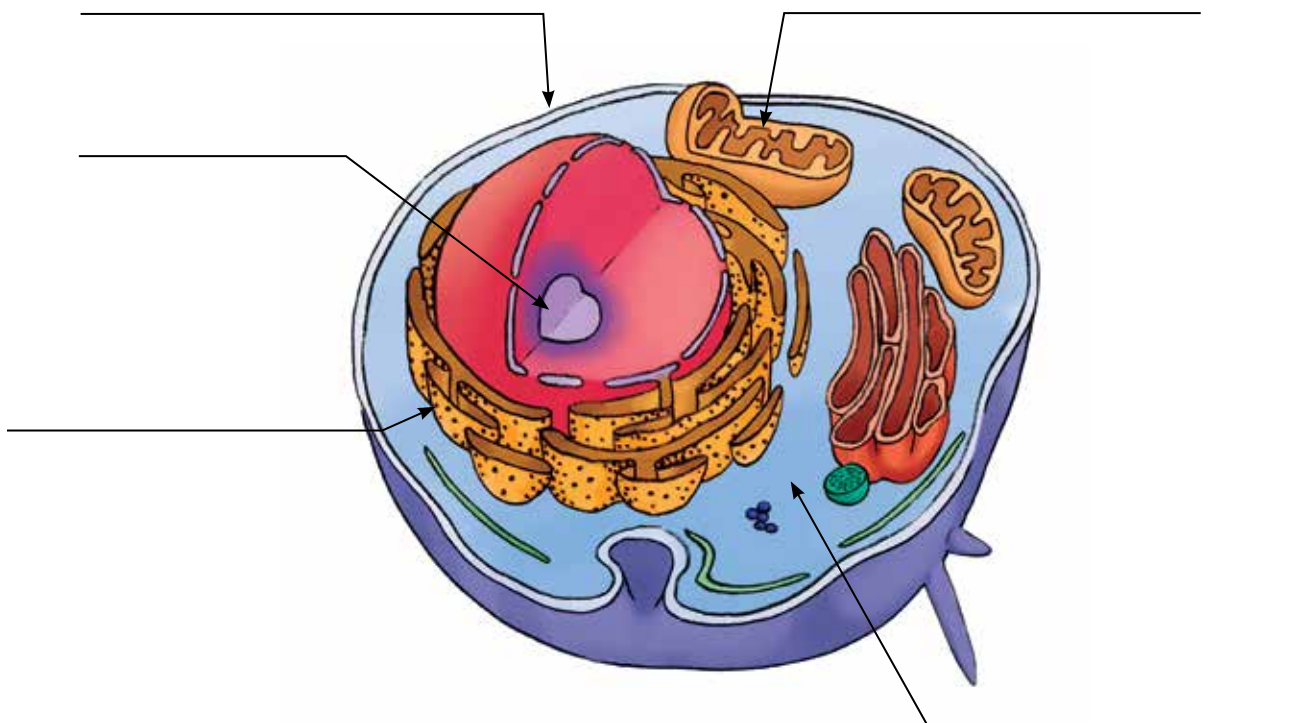
(the bronchioles narrow and it becomes harder to get enough air in)

This page intentionally left blank.

Week 2 Activity Sheets

How to be Good at Science, Technology, & Engineering

1. Label the parts of the animal cell. (p. 24)



2. Match the organelle with its function by placing the correct letter in the blank. (p. 24)

_____ The jellylike substance that the organelles sit in.

_____ This outer layer keeps water from leaking through.

_____ These folded tubes and sacs make proteins.

_____ These provide the cell with power.

_____ The set of instructions, DNA, is found here.

A. Nucleus

B. Mitochondria

C. Endoplasmic reticulum

D. Cell membrane

E. Cytoplasm

3. How can you tell just by looking at the image of the cell to the right that it is a plant cell? (p. 25)



Week 2 Activity Sheets

4. Write the correct term in front of the definition. (pp. 26–27)

_____ : Units that come in different shapes and types to perform specific tasks.

_____ : A collection of organs that work together.

_____ : Cells that collect in layers.

_____ : Various tissues that combine to perform a large task.



5. Name three different types of organ systems. (p. 27)

6. Match the nutrient with the food that provides it. **Hint:** Some foods provide more than one kind of nutrient. (pp. 28–29)

Proteins •

•



broccoli

Carbohydrates •

•



white bread

Lipids •

•



steak

Vitamins •

•



olive oil

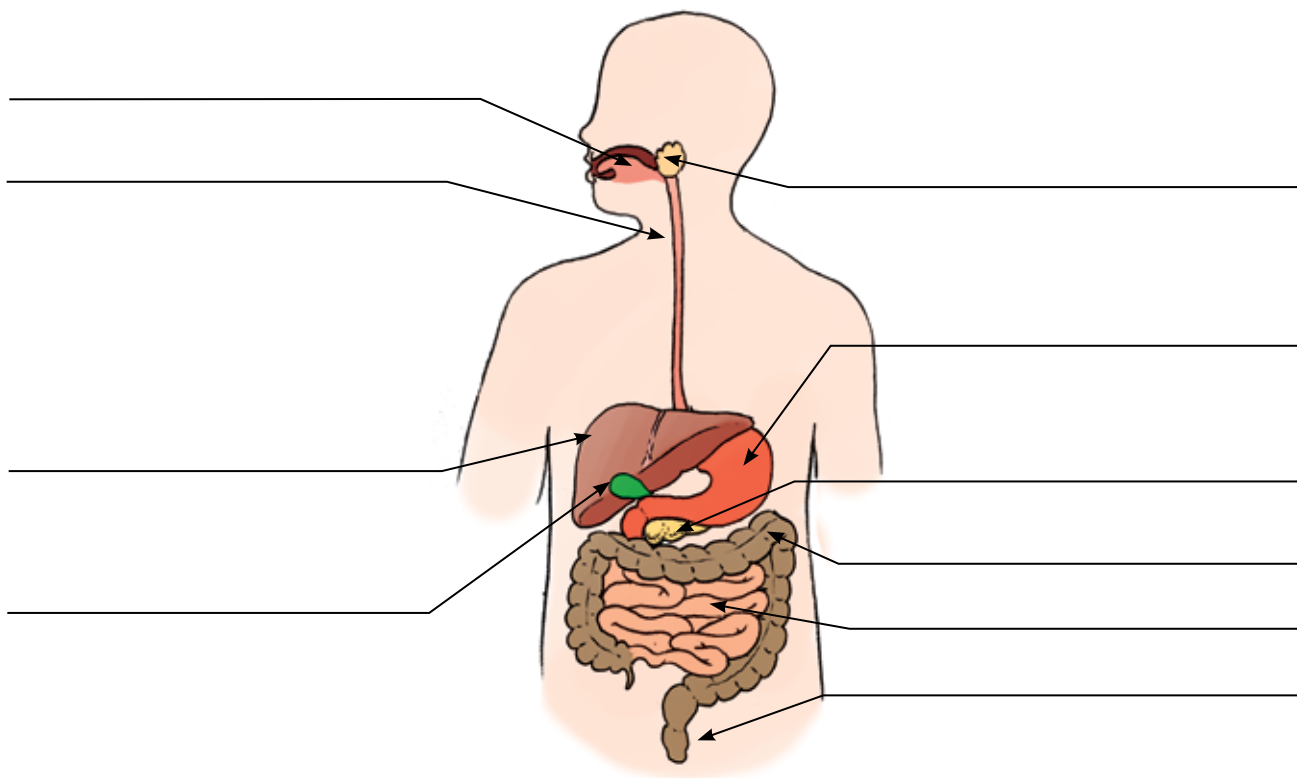
Minerals •

Fiber •

Week 2 Activity Sheets

7. Label the parts of the digestive system using the terms in the box. (p. 30)

Esophagus	Liver	Small intestine	Pancreas	Stomach
Gall bladder	Rectum	Large intestine	Mouth	Salivary gland



8. Match the function with the correct organ. (p. 30)

- | | | |
|--|---|--------------------------|
| Protein digestion begins here. | • | • Small intestine |
| Food is mashed up and moistened. | • | • Stomach |
| Because this organ has a huge surface area, food particles can be absorbed into the blood. | • | • Esophagus |
| This tube connects the mouth with the stomach and uses peristalsis to push it downward. | • | • Mouth |
| Excess water is reabsorbed here and feces are able to leave the body. | • | • Large intestine |



Week 2 Activity Sheets

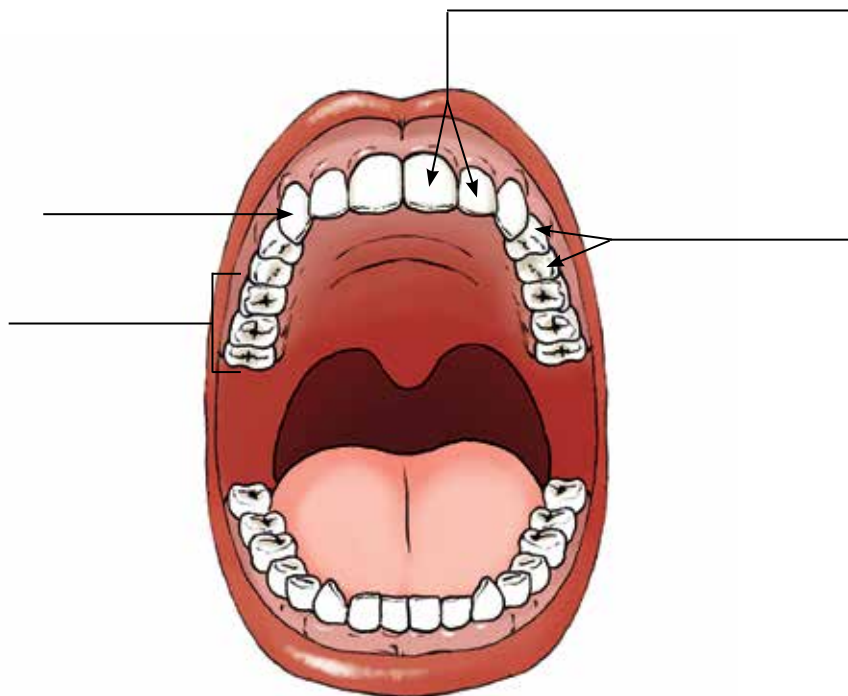
9. Circle the correct answer. Enzymes are very specific and only target certain food molecules to break their nutrients into small pieces for the body to absorb. (p. 31)

True

False

10. Label the types of teeth using the terms in the box below. (p. 32)

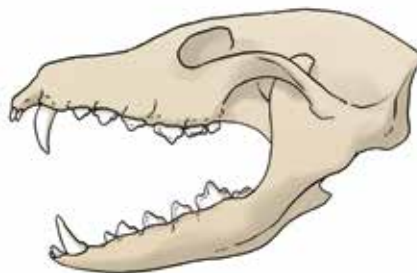
Canines
Molars
Incisors
Premolars



11. Complete the chart by placing the function of each type of tooth under the name. (p. 32)

Name of Tooth	Incisors	Canines	Premolars	Molars
Function of Tooth				

12. Write either **carnivore** or **herbivore** on the lines below to label which kind of animal each skull belongs to. (p. 33)



Week 2 Activity Sheets

13. Explain how oxygen gets from the air we breathe to a muscle cell. (p. 34)

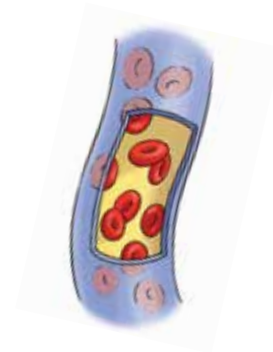
- _____ Oxygen is transported to the muscle via hemoglobin in the blood vessels.
- _____ Oxygen enters through the mouth or nose and moves into the lungs.
- _____ Oxygen is transferred into the blood.
- _____ Carbon dioxide, the waste product of respiration, is transferred into the lungs and breathed out.



14. Circle the correct word to complete the statement. **Aerobic** **Anaerobic** respiration uses oxygen to release energy. (pp. 34–35)

15. Match the type of respiration with the correct plant or animal. (p. 35)

- | | | | |
|----------------|---|---|---|
| Birds | • | • | Filaments in gills have blood vessels that absorb the oxygen. |
| Mammals | • | • | Stomata open and close to allow gases to come in and out. |
| Fish | • | • | Air travels only in one direction moving to air sacs located all over the body. |
| Insects | • | • | Oxygen inhaled and carbon dioxide is exhaled. |
| Plants | • | • | Spiracles on the side of the body lead to tiny tubes called tracheae. |



Week 2 Activity Sheets

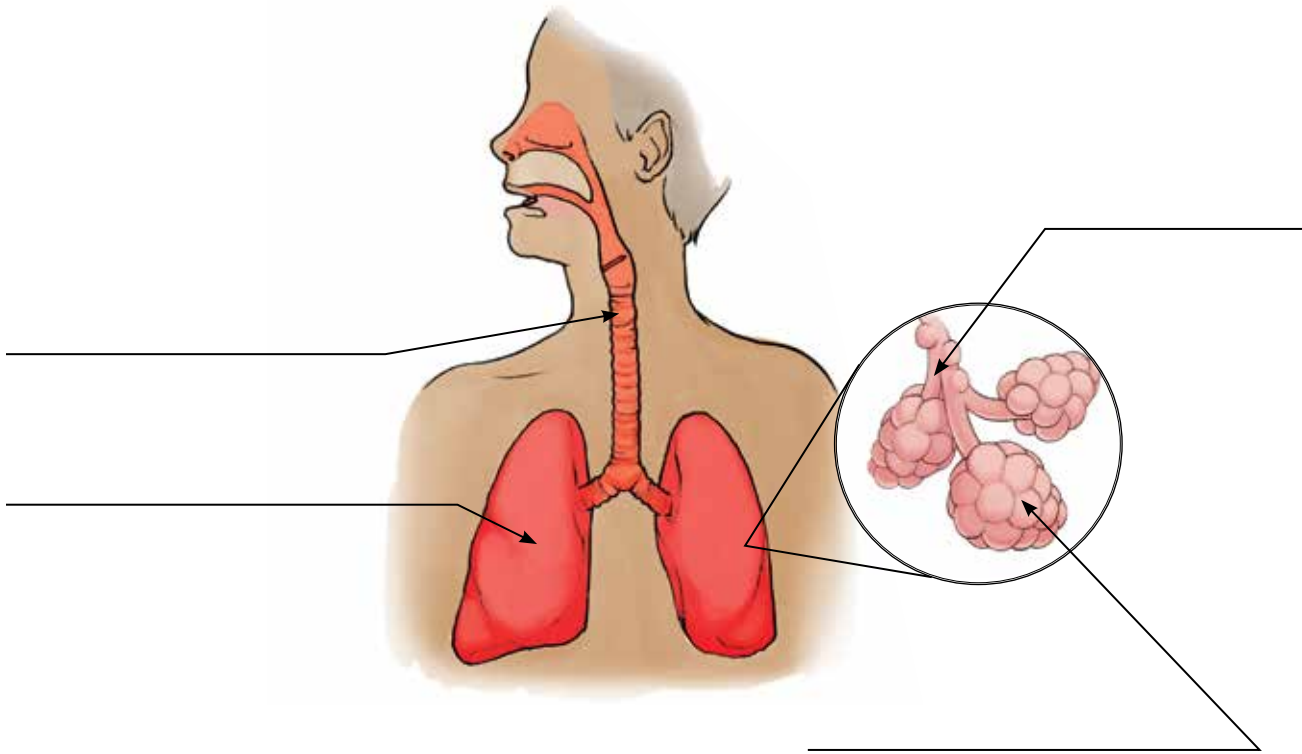
16. Use the terms in the box to label the diagram. (p. 36)

Trachea

Bronchiole

Lung

Alveoli



17. Number the steps of how a person breathes. (pp. 36–37)

- _____ Air moves into bronchioles then into alveoli.
- _____ The diaphragm muscle moves down as the rib cage moves up. The lungs expand.
- _____ Carbon dioxide waste moves from the blood through the alveoli to be breathed out.
- _____ Air is pulled in, moving down the trachea.
- _____ Oxygen passes through the alveoli walls to diffuse into the blood.
- _____ The diaphragm moves up, squeezing the lungs and expelling the carbon dioxide through the trachea.

18. Why does asthma make it more difficult for people to breathe? (p. 37)






Science F

Week 3 Schedule

©2021 by BookShark, LLC. All rights reserved. Do not copy without written permission from BookShark, LLC

Date:	Day 1	Day 2	Day 3	Day 4	Day 5
<i>How to be Good at Science, Technology & Engineering</i>	pp. 38–41	pp. 42–45 			
<i>Water</i>			pp. 36–37		
Activity Sheet Questions	#1–4	#5–9	#10–15		
Optional: Do Together			Sweat is Cool		
<i>BookShark Science F Experiments Book</i>				#3 What’s in Your Blood?	
Supplies	We provide (5SK): 2 feet string, pipe cleaner, button magnet, masking tape You provide: 1 disposable water bottle with lid (about 11-20 oz), 5 oz baby oil, water, 5 drops red food coloring, 1 oz vegetable oil, timer, thin towel or paper towel				
Shopping/Planning List	For next week: permanent marker, scissors, white paper (optional)				
Other Notes					

Day 1


How to be Good at Science, Technology & Engineering | pp. 38–41

There are eight different blood types: A+, A-, B+, B-, AB+, AB-, O+, O-. Each has its own special characteristic. The most common types are A+ and O+; about 71% of the population will have one or the other. The letters assigned to the blood type indicate what type of antigens are contained in the blood. The positive and negative indicates if the blood has a certain type of protein in it (+), or not (-).

It is important that types are identified before a blood transfusion occurs because if the donated blood is not

compatible with the recipient's blood type, the recipient's antibodies may attack the transfused blood and cause a toxic reaction or cause the blood to clump; either scenario is not good for the patient. A+ can only be given to people with A+ or AB+, but O+ can be given to anyone with a positive blood type. While only approximately 8% of the population have O-, it can be given to anyone regardless of patient's blood type, hence the term "universal donor" applies to people with O- blood. A patient with AB+ blood can receive any blood type. [p. 39]

Activity Sheet Questions | #1–4

 Special Note to Mom or Dad



Notes

Week 3

Day 2

How to be Good at Science, Technology & Engineering | pp. 42–45

Note: On pages 42–43, you will discuss body water and excretion (feces and urine).

Activity Sheet Questions | #5–9

Day 3

Water | pp. 36–37

Activity Sheet Questions | #10–15

Optional: Do Together | Sweat is Cool

This week, you studied the heart, blood, body water, and excretion. Tie all these systems together in a fun way by exercising together! Make time this week to talk with your students about their favorite forms of exercise. Then choose an activity everyone will enjoy doing together and find out how long it takes for each of you to work up a good sweat. Make sure you hydrate! Afterward, discuss what you learned about sweat and the purpose of its cooling properties. What do your students think about their bodies when they sweat? Discuss how your exercise may impact the different body systems you have studied so far this year.

Day 4

BookShark Science F Experiments Book | #3

What's in Your Blood? ■

Week 3 Activity Sheets

How to be Good at Science, Technology, & Engineering

1. Write **arteries**, **veins**, or **capillaries** beside the characteristic of the blood vessel. Responses will be used more than once. (p. 38)



- _____ (veins): These vessels return blood to the heart.
- _____ (arteries): These vessels are very strong.
- _____ (veins): These vessels have valves in them to keep blood from flowing backwards.
- _____ (capillaries): Diffusion takes place in these vessels.
- _____ (arteries): The walls of these vessels are thick because of the high pressure in them.
- _____ (veins): The walls of these vessels are thin because the pressure is low.
- _____ (capillaries): These vessels are microscopic.

2. **Critical Thinking:** Match the name of the component of blood to the scenario below. (p. 39)

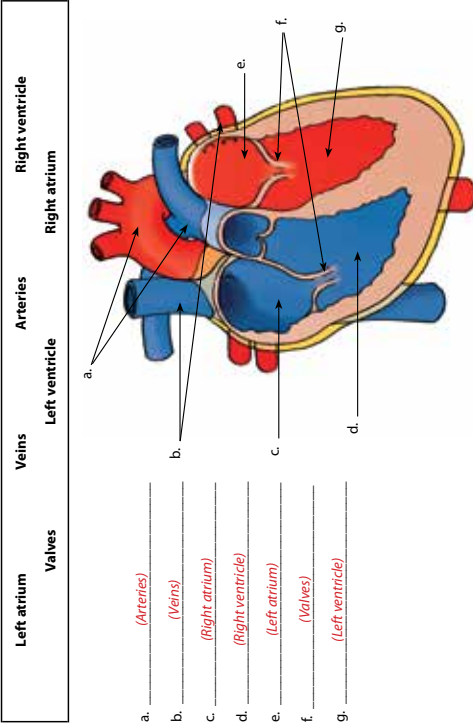
- Red Blood Cells**
- White Blood Cells**
- Platelet**
- Plasma**

- A friend has scraped her knee and is bleeding.
This component will help stop the bleeding.
- All the other blood components travel in this liquid.
- The soccer team is practicing for the next game and needs a lot of oxygen supplied to their muscles.
This blood component will carry it there.
- It is flu season and most of your family is sick in bed.
This blood component is fighting to kill that flu virus.



Week 3 Activity Sheets

3. Label the diagram of the heart below by writing the word from the box on the corresponding line. (p. 40)



4. The right side of the heart pumps blood to the _____ (lungs) where the blood picks up _____ (oxygen) and releases _____ (carbon dioxide). The oxygen-rich blood returns to the _____ (left) side of the heart. The blood is pumped to all the organs to deliver _____ (oxygen). Now, the blood is low in oxygen and returns to the _____ (heart) to start the cycle over. (p. 41)

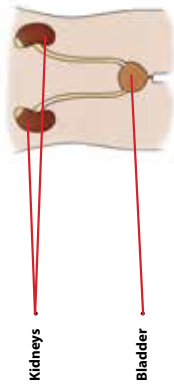
5. Match the organ with its excretory function. (p. 42)



- | | |
|----------------|--|
| Liver | Stores urine that comes from the kidneys. |
| Kidney | Removes water and salts from the body. |
| Bladder | Produces a waste chemical called urea that comes from it breaking down proteins. |
| Lungs | Removes carbon dioxide from the body. |
| Skin | Creates urine which has urea, excess water, and other waste products in it. |

Week 3 Activity Sheets

6. Draw lines to label the following illustration showing the different organs involved in urinary excretion. (p. 42)



7. Put the following steps of the process of building an immunity in order using the numbers 1, 2, 3, 4, 5, and 6. (p. 44)

- (2) White blood cells try to find a match to their receptor molecules among the germs.
- (4) Antibodies are released and travel throughout the body to attach to germs.
- (3) The white blood cell gets triggered by the match and divides to make thousands of new cells with these same receptor molecules.
- (1) Germs spread and can enter a human body in the air or by other body fluids.
- (5) The new antibodies signal phagocytes to destroy the germs.
- (6) Memory cells are made by the same blood cell that first detected the germ.



8. Put a checkmark beside each of the following that is a body barrier to germs. (p. 45)

- ☒ Hairs in your nose
- ☐ Thin walls in the intestines
- ☒ Acid in your stomach
- ☒ Skin



9. Explain how the human body reacts to an injury that has allowed germs to enter. (p. 45)

Once the injury has occurred, damaged cells around the wound release chemicals that trigger inflammation. Nearby blood vessels widen which makes the skin red. They let fluid leak out causing the area to swell. White blood cells attack and consume the germs then the damaged tissue heals.



Week 3 Activity Sheets

Water

10. Circle the substance that keeps the skin's outer layer lubricated and water-repellent. (p. 36)

- Sebum
- Mucus
- Saliva
- Keratin

11. Circle the substance that acts as a barrier to make the skin waterproof. (p. 36)

- Sebum
- Mucus
- Saliva
- Keratin



12. Name two jobs blood is responsible for in your body. (p. 37)

- 1) possible transports oxygen, food and water; fights disease; seals damaged skin
- 2)

13. Which part of your blood is 90% water? (p. 37)

- Red Blood Cells
- White Blood Cells
- Plasma

What does it do? (plasma is the liquid that carries the blood cells)

14. Does your body lose most of the water it releases into your food to help digest it? Explain. (p. 37)

(no—almost all of the water released into digestive juices is recovered in the large intestine)

15. Why do your joints need water? (p. 37)

(without some kind of lubrication, bones in your joints would grind together and wear away)

How do your joints get the water they need? (membranes secrete watery synovial fluid to lubricate joints)

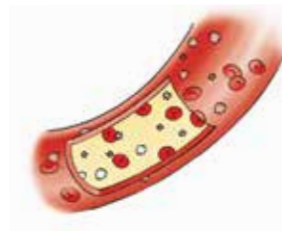


Week 3 Activity Sheets

How to be Good at Science, Technology, & Engineering

1. Write **arteries**, **veins**, or **capillaries** beside the characteristic of the blood vessel.

Responses will be used more than once. (p. 38)



- _____: These vessels return blood to the heart.
- _____: These vessels are very strong.
- _____: These vessels have valves in them to keep blood from flowing backwards.
- _____: Diffusion takes place in these vessels.
- _____: The walls of these vessels are thick because of the high pressure in them.
- _____: The walls of these vessels are thin because the pressure is low.
- _____: These vessels are microscopic.

2. **Critical Thinking:** Match the name of the component of blood to the scenario below. (p. 39)

Red Blood Cells •

- A friend has scraped her knee and is bleeding. This component will help stop the bleeding.

White Blood Cells •

- All the other blood components travel in this liquid.

Platelet •

- The soccer team is practicing for the next game and needs a lot of oxygen supplied to their muscles. This blood component will carry it there.

Plasma •

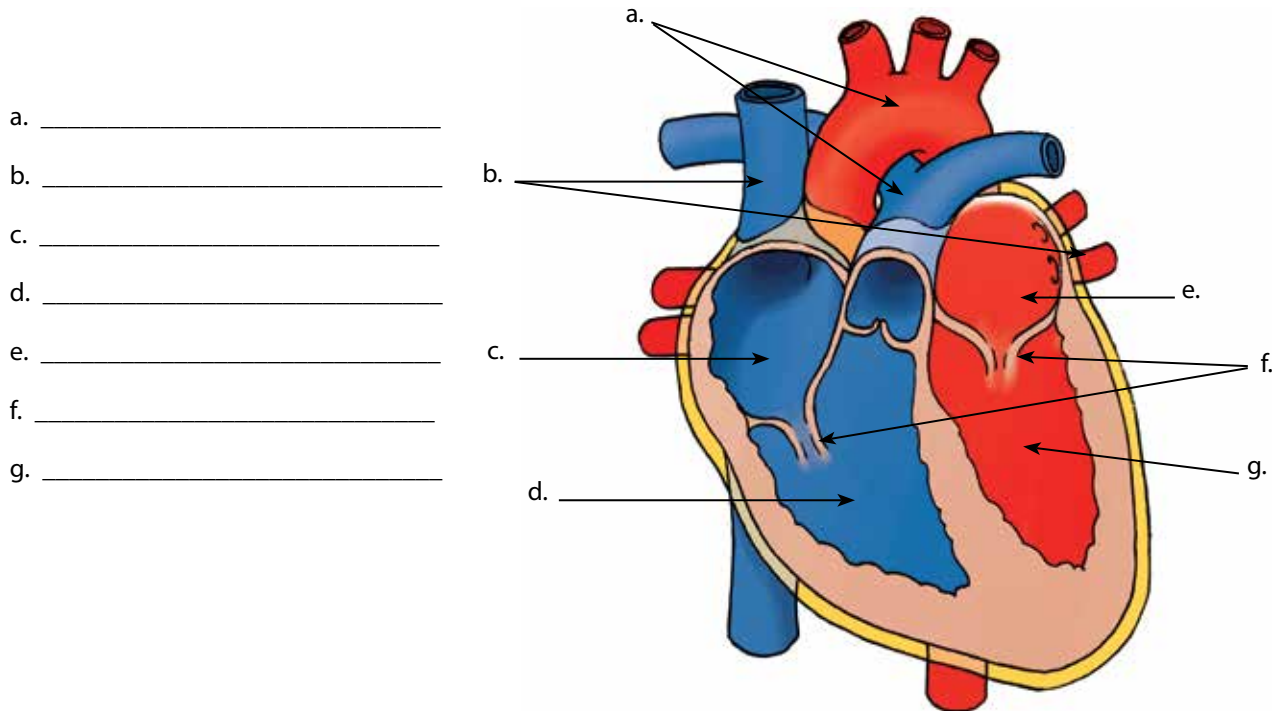
- It is flu season and most of your family is sick in bed. This blood component is fighting to kill that flu virus.



Week 3 Activity Sheets

3. Label the diagram of the heart below by writing the word from the box on the corresponding line. (p. 40)

Left atrium	Veins	Arteries	Right ventricle
Valves	Left ventricle	Right atrium	



- a. _____
 b. _____
 c. _____
 d. _____
 e. _____
 f. _____
 g. _____

4. The right side of the heart pumps blood to the _____ where the blood picks up _____ and releases _____. The oxygen-rich blood returns to the _____ side of the heart. The blood is pumped to all the organs to deliver _____. Now, the blood is low in oxygen and returns to the _____ to start the cycle over. (p. 41)



5. Match the organ with its excretory function. (p. 42)



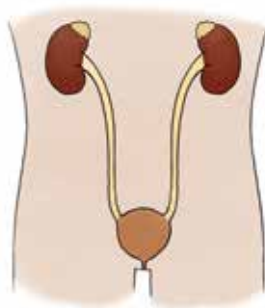
- | | | |
|----------------|---|--|
| Liver | • | • Stores urine that comes from the kidneys. |
| Kidney | • | • Removes water and salts from the body. |
| Bladder | • | • Produces a waste chemical called urea that comes from it breaking down proteins. |
| Lungs | • | • Removes carbon dioxide from the body. |
| Skin | • | • Creates urine which has urea, excess water, and other waste products in it. |

Week 3 Activity Sheets

6. Draw lines to label the following illustration showing the different organs involved in urinary excretion. (p. 42)

Kidneys •

Bladder •



7. Put the following steps of the process of building an immunity in order using the numbers 1, 2, 3, 4, 5, and 6. (p. 44)

_____ White blood cells try to find a match to their receptor molecules among the germs.

_____ Antibodies are released and travel throughout the body to attach to germs.

_____ The white blood cell gets triggered by the match and divides to make thousands of new cells with these same receptor molecules.

_____ Germs spread and can enter a human body in the air or by other body fluids.

_____ The new antibodies signal phagocytes to destroy the germs.

_____ Memory cells are made by the same blood cell that first detected the germ.



8. Put a checkmark beside each of the following that is a body barrier to germs. (p. 45)



- ☐ Hairs in your nose
- ☐ Thin walls in the intestines
- ☐ Acid in your stomach
- ☐ Skin

9. Explain how the human body reacts to an injury that has allowed germs to enter. (p. 45)



Week 3 Activity Sheets

Water

10. Circle the substance that keeps the skin's outer layer lubricated and water-repellent. (p. 36)

Sebum

Mucus

Saliva

Keratin

11. Circle the substance that acts as a barrier to make the skin waterproof. (p. 36)

Sebum

Mucus

Saliva

Keratin

12. Name two jobs blood is responsible for in your body. (p. 37)

1) _____

2) _____



13. Which part of your blood is 90% water? (p. 37)

Red Blood Cells

White Blood Cells

Plasma

What does it do? _____

14. Does your body lose most of the water it releases into your food to help digest it? Explain. (p. 37)

15. Why do your joints need water? (p. 37)

How do your joints get the water they need? _____



Science F—Weekly Subject List

Week	Subject	Skills
1	Introduction to science and how it works; Types of science; Introduction to living things	Asking Questions and Defining Problems; Constructing Explanations and Designing Solutions
2	Introduction to cells; Systems in your body; Digestive system; Respiratory system	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
3	Circulatory system; Excretory system; How your body fights germs; The importance of water	Developing and Using Models; Engaging in Argument from Evidence
4	Nervous system; Seeing; Hearing; Muscular system; Skeletal system	Developing and Using Models; Engaging in Argument from Evidence
5	Staying healthy; Reproduction; Life cycles of different types of living things	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
6	More life cycles; Human reproductive system; Human life cycles; Introduction to genetics	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
7	Introduction to plants; Plant life cycle; Parts of a plant; Why plants need water	Using Mathematics and Computational Thinking; Planning and Carrying Out Investigations
8	Introduction to seeds; How seeds grow into plants; Types of seeds; The smallest living things; Ecosystems	Developing and Using Models; Engaging in Argument from Evidence
9	What makes up the different states of matter; Properties of matter	Using Mathematics and Computational Thinking; Planning and Carrying Out Investigations; Analyzing and Interpreting Data
10	Matter mixed together; Separating matter that has been mixed; Introduction to elements	Planning and Carrying Out Investigations; Analyzing and Interpreting Data
11	Bonds between elements; Chemical reactions	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
12	Acids and bases; Ionic elements; The periodic table; Properties of metals; Reactiveness of elements	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
13	How we use metals; The importance of hydrogen and carbon	Using Mathematics and Computational Thinking; Obtaining; Evaluating; and Communicating Information; Asking Questions and Defining Problems
14	The gases that are found in earth's atmosphere; Other gases that we use; Composites and polymers	Planning and Carrying Out Investigations; Asking Questions and Defining Problems
15	Introduction to energy; Producing energy; Temperature and energy	Using Mathematics and Computational Thinking; Planning and Carrying Out Investigations; Analyzing and Interpreting Data
16	Introduction to waves; Light and sound waves	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
17	How we can affect light waves for our use; Other types of waves we use	Developing and Using Models; Engaging in Argument from Evidence
18	Static electricity; Electric current; How we can use electric current	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
19	Waves that transmit information; Binary code; Circuits; Forces; Magnets; Gravity	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
20	Friction; Wind resistance; Newton's laws of motion; Inertia; Momentum; Simple machines	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
21	Work; Velocity; Acceleration; Gravity; Weight versus mass; Lift; Flotation; Density	Using Mathematics and Computational Thinking; Planning and Carrying Out Investigations
22	The solar system; Celestial bodies; Details of the Sun; Gravity between celestial bodies; Details of the Moon and its effects on Earth	Planning and Carrying Out Investigations; Analyzing and Interpreting Data
23	Stars and the light they produce; How we explore the universe; The solar system; Other celestial bodies; Other properties of the sun; The relationship between sun; Moon and Earth	Developing and Using Models; Using Mathematics and Computational Thinking; Obtaining, Evaluating, and Communicating Information

Week	Subject	Skills
24	Why there is life on Earth; The Moon; Venus; Mars; Jupiter	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
25	Saturn; Uranus; Neptune; Pluto; Asteroids; Comets; Meteorites	Developing and Using Models; Analyzing and Interpreting Data; Obtaining, Evaluating, and Communicating Information
26	Space exploration; Galaxies; Stars	Developing and Using Models; Engaging in Argument from Evidence
27	Variable stars; Constellations; How we see stars	Developing and Using Models; Engaging in Argument from Evidence
28	Constellation stories; Looking at the moon; Layers of the earth; Plate tectonics; Earthquakes; Tsunamis; Volcanic eruptions; Rocks and minerals	Developing and Using Models; Engaging in Argument from Evidence
29	How rocks form; Types of rock; Weathering; Erosion; Ground water	Developing and Using Models; Engaging in Argument from Evidence
30	The water cycle; Rivers; Glaciers; Ocean water	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
31	Saltwater; Freshwater; Natural ice; Water movement; Water affects light; Water in different forms	Developing and Using Models; Using Mathematics and Computational Thinking; Analyzing and Interpreting Data
32	How humans affect water; What people try to do with water; How water can hurt people; How water can help people	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
33	Pollution; Water use; Seasons; Climate zones; Atmosphere layers; Weather	Planning and Carrying Out Investigations; Analyzing and Interpreting Data
34	The carbon cycle; Why we need the right amount of carbon; What affects water in the ocean; How temperature affects air; How air affects weather	Using Mathematics and Computational Thinking; Planning and Carrying Out Investigations
35	Precipitation affects climates on land; Global warming; Rachel Carson	Planning and Carrying Out Investigations; Engaging in Argument from Evidence
36	Rachel Carson; The affect of pesticides	Planning and Carrying Out Investigations; Engaging in Argument from Evidence

©2021 by BookShark, LLC. All rights reserved. Do not copy without written permission from BookShark, LLC