



Lesson Plan: Cells: The Basic Units of Life

Grade Level: 6

Subject: Life Science

Duration: 45–60

NGSS MS-LS1-1: Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

Learning Objectives

By the end of this lesson, students will be able to:

- **Identify** the basic structures found in all cells, including the cell membrane, cytoplasm, and nucleus.
- **Describe** the functions of key organelles such as mitochondria, chloroplasts, and the



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

called chromatin, which directs all cell functions.

- **Organelle:** A structure within the cell that carries out a specific function, such as mitochondria for energy or ribosomes for making proteins.
- **Mitochondria:** Rod-shaped organelles that convert energy in food molecules to a form the cell can use, producing most of the cell's energy.
- **Chloroplast:** An organelle found in plant cells that contains chlorophyll, which captures energy from the Sun and uses it to produce food in the form of sugar during photosynthesis.
- **Cell wall:** A rigid outer layer of plant cells and certain other living organisms that provides support and protects the cell.



Materials Needed: (all links are included in this PDF)

- Printed copies of the Study Guide (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-cells-the-basic-units-of-life-1.pdf>)
- Activity Lesson with cell diagrams (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-cells-the-basic-units-of-life-1-cells-the-basic-units-of-life-3.pdf>)
- Worksheet 0 (cell history and microscopy) (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-cells-the-basic-units-of-life-1-0.pdf>)
- Worksheet 1 (cell structures) (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-cells-the-basic-units-of-life-1-1.pdf>)
- Vocabulary matching worksheet (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-cells-the->)



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

named cells by looking at cork.

Step 2: Direct Instruction (15 minutes)

- Use the Study Guide to explain the cell theory: all living organisms are made of cells, cells are produced from other living cells, and cells are the basic building blocks of life. (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-cells-the-basic-units-of-life-1.pdf>)
- Display the labeled animal and plant cell diagrams from the Activity Lesson and identify key organelles: nucleus, cell membrane, cytoplasm, mitochondria, endoplasmic reticulum, Golgi



bodies, ribosomes, and vacuoles. (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-cells-the-basic-units-of-life-1-cells-the-basic-units-of-life-3.pdf>)

- Place a drop of pond water or prepared slide under a microscope to demonstrate living cells if equipment is available, or show a short video of cells under magnification.
- Explain the two key differences between plant and animal cells: plant cells have chloroplasts for photosynthesis and a rigid cell wall for support.

Step 3: Guided Practice (15 minutes)

- Distribute the vocabulary matching worksheet and work through the first two terms as a class, reinforcing definitions. (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-cells-the-basic-units-of-life-1-1.pdf>)
- Hand out the Activity Lesson cut-and-paste sheets and guide students through coloring and cutting out one or two organelles together, discussing their functions. (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-cells-the-basic-units-of-life-1-cells-the-basic-units-of-life-2.pdf>)



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

(<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-cells-the-basic-units-of-life-1-0.pdf>)

- Review completed cell diagrams for accuracy of organelle placement and labeling.
- Have students classify the following as found in plant cells only, animal cells only, or both: cell wall, chloroplast, mitochondria, nucleus, cell membrane.



Differentiation Strategies



For advanced learners:

- Challenge students to research and diagram a specialized cell type such as a nerve cell, muscle cell, or red blood cell, identifying unique adaptations.
- Have advanced learners compare prokaryotic and eukaryotic cells in detail, creating a Venn diagram that includes examples of each type.

For learners needing support:

- Provide pre-cut organelle pieces and a labeled reference diagram so students can focus on matching and placement rather than cutting.
- Offer one-on-one or small-group support during the cut-and-paste activity, using the labeled diagrams from the Activity Lesson as a visual guide.

Extension Activities



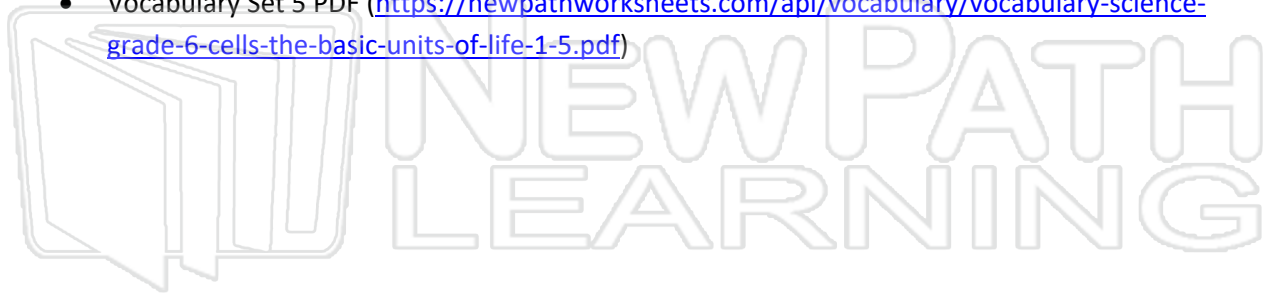
PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

- Worksheet 0 PDF (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-cells-the-basic-units-of-life-1-0.pdf>)
- Worksheet 1 PDF (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-cells-the-basic-units-of-life-1-1.pdf>)
- Worksheet 2 PDF (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-cells-the-basic-units-of-life-1-2.pdf>)
- Vocabulary Set 1 PDF (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-cells-the-basic-units-of-life-1-1.pdf>)



- Vocabulary Set 2 PDF (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-cells-the-basic-units-of-life-1-2.pdf>)
- Vocabulary Set 3 PDF (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-cells-the-basic-units-of-life-1-3.pdf>)
- Vocabulary Set 4 PDF (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-cells-the-basic-units-of-life-1-4.pdf>)
- Vocabulary Set 5 PDF (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-cells-the-basic-units-of-life-1-5.pdf>)



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet



CELLS: THE BASIC UNITS OF STRUCTURE

Discovering Cells

For the majority of human history we have not been able to see things that are on a small scale. In the late 16th century, that all changed with the invention of the **microscope**.

It wasn't until almost 100 years after the invention of the microscope that Robert Hooke discovered and named the cell by looking at a thin slice of cork.



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

Both discoveries lead to the development of the cell theory.

The Cell Theory

The cell theory was developed in response to the discoveries of Schleiden and Schwann.

The cell theory declares that:

- Cells are produced from other living cells
- All living organisms are made up of cells, and that
- Cells are the basic building blocks of all living organisms.

Important Technologies

The **light microscope** not only makes things look larger, but it also shows the object in detail. Without good magnification and sharp resolution, the light microscope would have been useless.

Magnification is when an object is made to look bigger. **Resolution** is when an object is made to appear more clearly. An image that has sharp or high resolution is not blurry and details of the image are very clear. This is very important in scientific research.

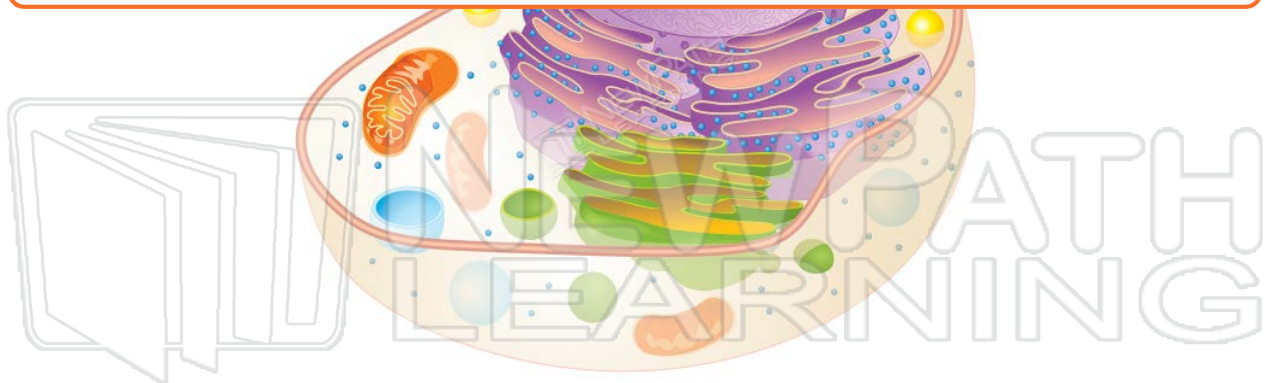
Electron Microscope

The electron microscope was first developed in the 1930's. An electron microscope uses a beam of incredibly small particles called electrons that bounce off of the object being magnified. The electron



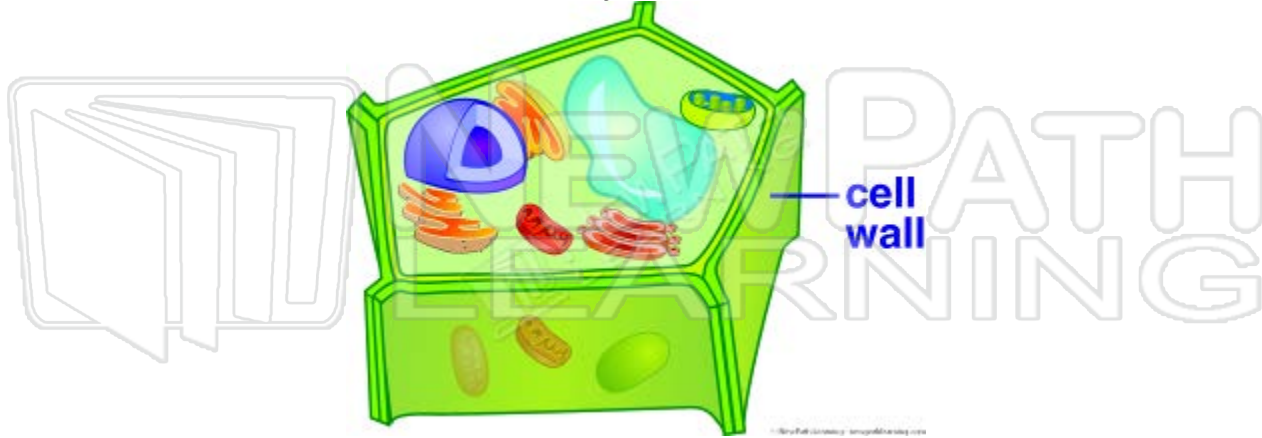
PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet



The cell's organelles

The **cell wall** is a rigid outer layer of plant cells and certain other living organisms. Inside the cell wall is a layer called the **cell membrane**, which is the outer layer of all animal cells.



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

The **cytoplasm** is a substance outside the nucleus where the cell's organelles are held. It is made almost entirely of water.

The organelles that are located in the cytoplasm are:

- The **chloroplast** captures energy from the sun and converts it into food and is only found in plant cells.
- The **endoplasmic reticulum** is the transport system that takes different materials around the cell.

- The **Golgi bodies** direct the different materials made in the cell to where they need to go.
- The **lysosomes** break down food molecules and old cell parts to be used for energy production.
- The **mitochondria** is a rod-like structure that produces most of the energy that is used by the cell.
- The **ribosome** is an organelle that produces proteins.
- The **vacuoles** are used for storing materials from the cell.

Plant and Animal Cell Differences

Plant and animal cells are very similar with cellular structures, but vary in two major aspects.

Plant cells contain **chloroplasts** that give the cells their green color. Chloroplasts are the organelles that capture energy from the sun and convert it into food and oxygen in a process known as photosynthesis.



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet



Lesson Checkpoint:
What are the two key differences between plant and animal cells?



Cells - The Basic Units of Life

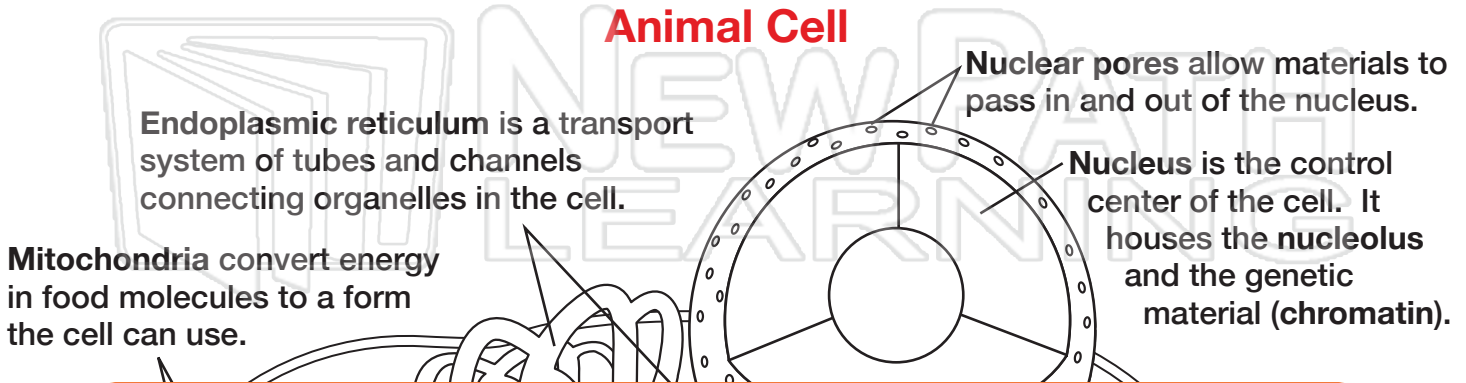
Sci
F

Name _____ Class _____ Date _____

The **cell** is the **basic building block** of all living organisms. It is the smallest unit of an organism that can carry out the functions of life.

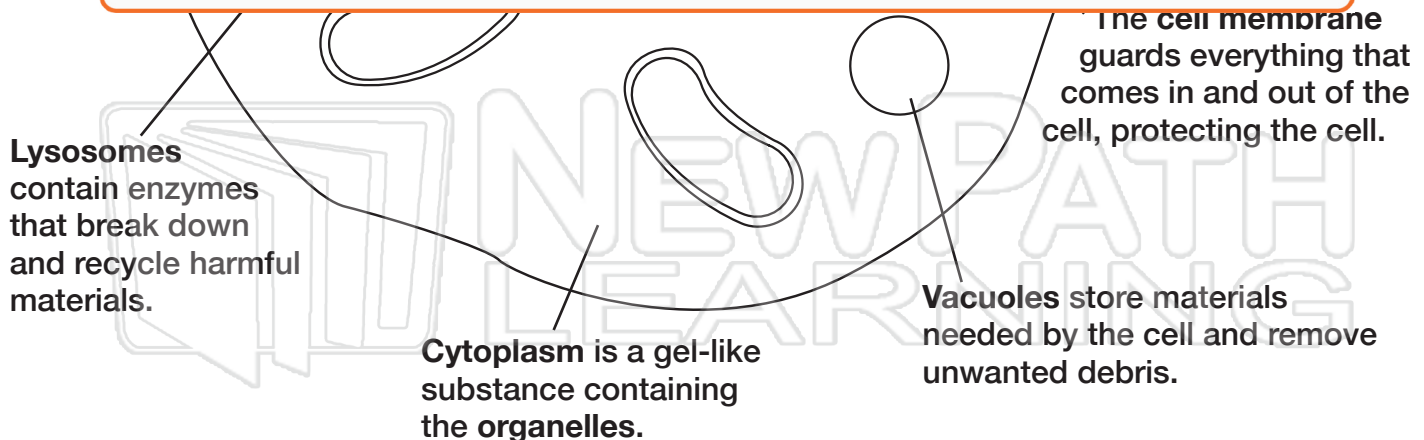
Some cells are **single**, self-sustaining organisms such as amoebas and bacteria; others cells are part of **multicellular** organisms and cannot survive alone.

Animal Cell



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet





Cells - The Basic Units of Life

Sci
F

Name _____ Class _____ Date _____

Animal and plant cells have similar and different **organelles**. Plant cells have special parts such as **chloroplasts** and a **cell wall** that animal cells do not.

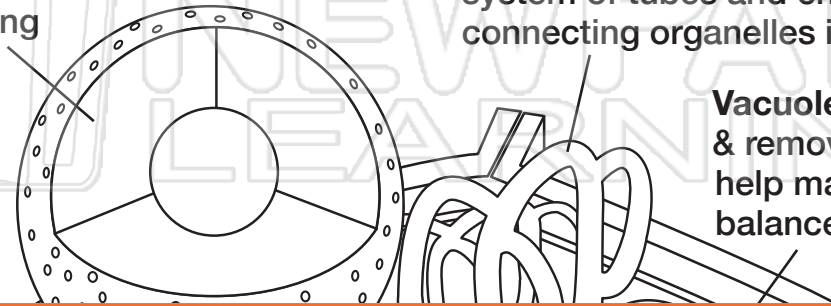
Plant Cell

The **nucleus** is the control center of the cell - it makes sure the cell is working properly.

Endoplasmic reticulum is a transport system of tubes and channels connecting organelles in the cell.

Golgi bodies package and direct materials made in the cell to where they need to go.

Vacuoles store materials & remove debris. They help maintain water balance in plant cells.



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

Mitochondria provide energy to the cell.

Cell membrane at the edge of the cell.

Chloroplasts contain **chlorophyll** which captures energy from the Sun and uses it to produce food for the plant in a process known as **photosynthesis**.

Cell wall is a rigid outer layer of plant cells that provides support and protects the cell.

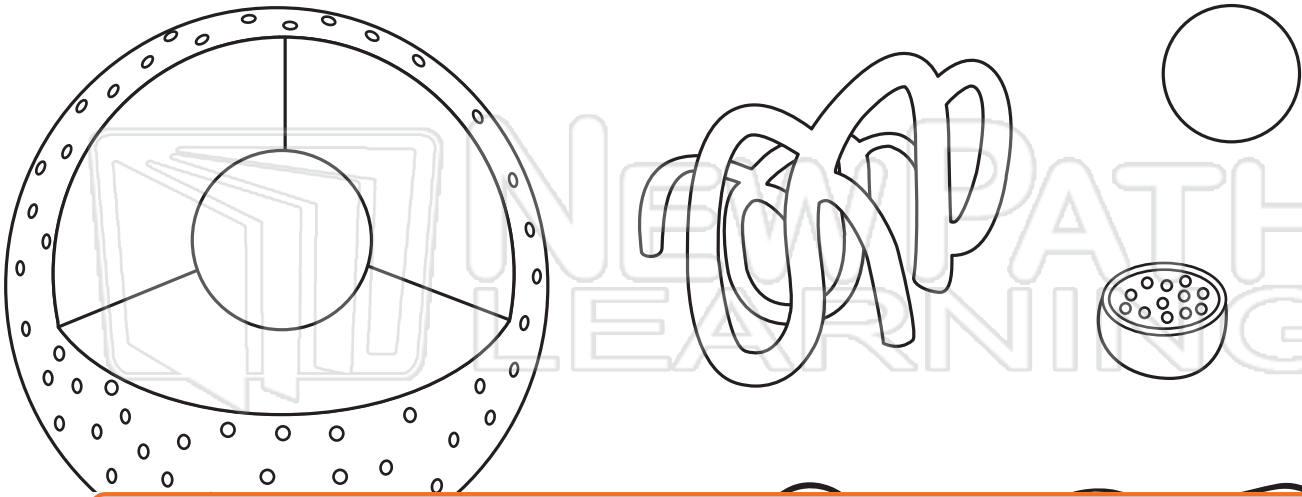


Cells - The Basic Units of Life

Sci
F

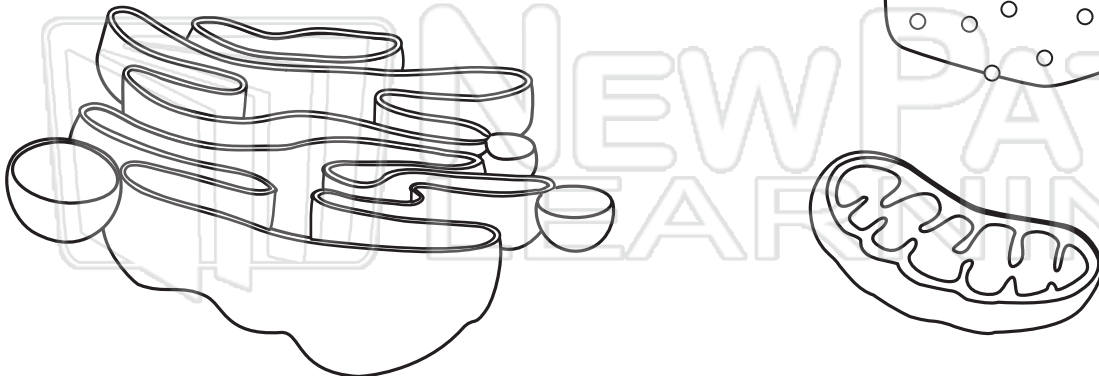
Name _____ Class _____ Date _____

Color and cut out the organelles. Use the pieces to make an animal cell.



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet





Name _____ Class _____ Date _____

Add organelles to the animal cell. Label them.



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

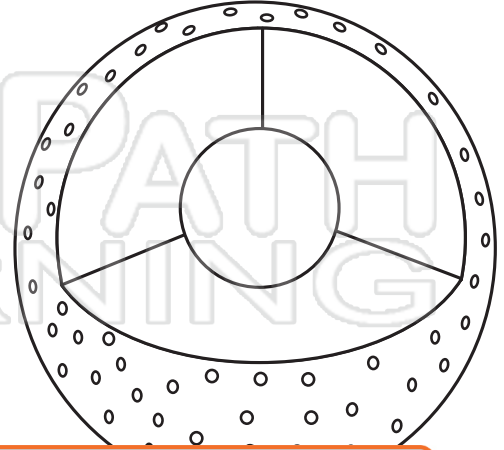
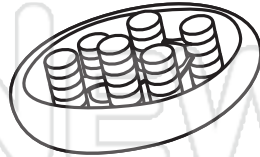
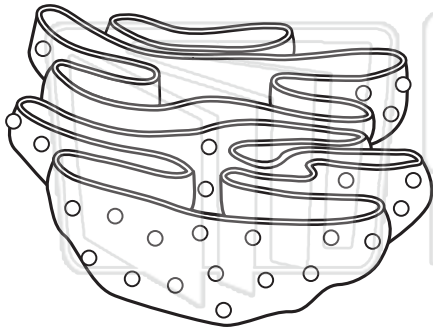


Cells - The Basic Units of Life

Sci
F

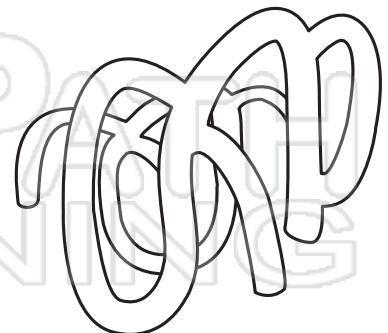
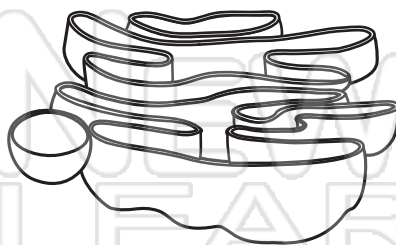
Name _____ Class _____ Date _____

Color and cut out the organelles. Use the pieces to make a plant cell.



PREVIEW

Please [Sign In](#) or [Sign Up](#) to download
the printable version of this worksheet





Cells - The Basic Units of Life

Sci
F

Name _____ Class _____ Date _____

Add organelles to the plant cell. Label them.



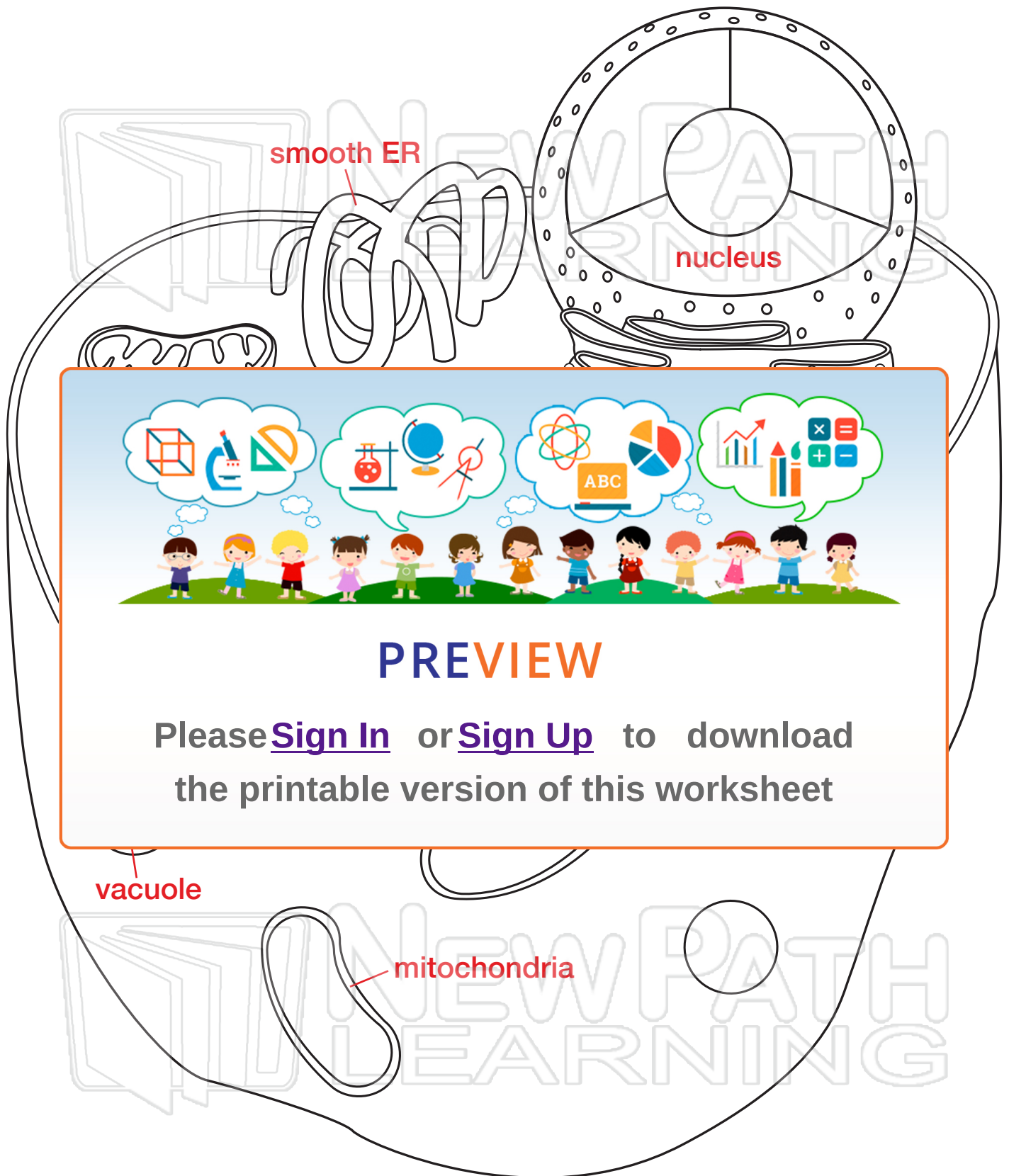
PREVIEW

Please [Sign In](#) or [Sign Up](#) to download
the printable version of this worksheet



Answer Key - example

Add organelles to the animal cell. Label them.



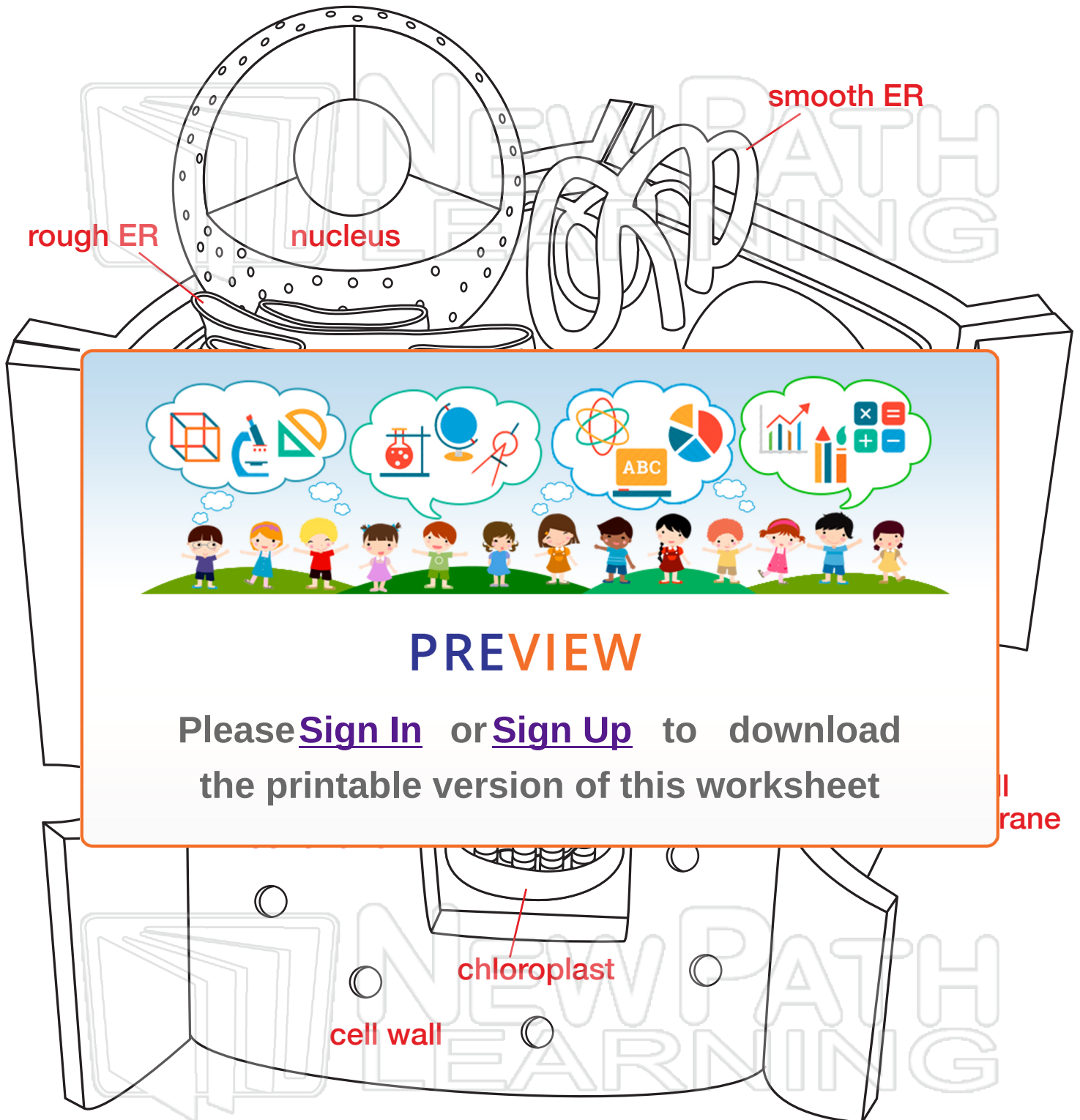
PREVIEW

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet



Answer Key - example

Add organelles to the plant cell. Label them.





Name _____ Class _____ Date _____

- 1 The invention of _____ allowed people to see objects that are very small.

A the telescope
B the microscope
C the kaleidoscope
D binoculars



- 2 When **Robert Hooke** looked at **cork** through a microscope, he named what he saw 'cells' because _____.

A he could barely see what he was looking at
B the cork looked like shells
C they were the initials of his children
D the cork looked like tiny rectangular rooms



- 3 **Anton van Leeuwenhoek** discovered _____.

A cells
B bacteria
C compound microscopes
D simple microscopes



- 4 **Matthias Schleiden** discovered that _____.

A all cells are round
B all cells are rectangular
C all plants are made up of cells

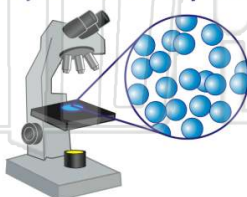


PREVIEW

- 7 Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

- 9 If something is in **high resolution** you can see an object, but not very clearly.

A true
B false



- 10 they really are
D changing the lens that is being used to see the object

- How does the **electron microscope** have such **high resolution**?

A It uses a beam of electrons that are bounced off of the object being magnified.
B It uses a beam of electrons to put pressure on the object being magnified.
C It doesn't use a beam of electrons.
D It uses a beam of electrons to break apart the object being magnified.



Name _____ Class _____ Date _____

- 1 The invention of _____ allowed people to see objects that are very small.

A the telescope
B the microscope
C the kaleidoscope
D binoculars



(B)

- 2 When **Robert Hooke** looked at **cork** through a microscope, he named what he saw 'cells' because _____.

A he could barely see what he was looking at
B the cork looked like shells
C they were the initials of his children
D the cork looked like tiny rectangular rooms



(D)

- 3 **Anton van Leeuwenhoek** discovered _____.

A cells
B bacteria
C compound microscopes
D simple microscopes



(B)

- 4 **Matthias Schleiden** discovered that _____.

A all cells are round
B all cells are rectangular
C all plants are made up of cells



(C)

5



(A)

PREVIEW

7

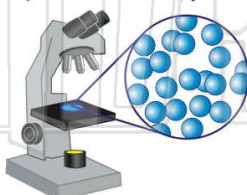
Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

(C)

9

- If something is in **high resolution** you can see an object, but not very clearly.

A true
B false



(B)

- 10 How does the **electron microscope** have such **high resolution**?

A It uses a beam of electrons that are bounced off of the object being magnified.
B It uses a beam of electrons to put pressure on the object being magnified.
C It doesn't use a beam of electrons.
D It uses a beam of electrons to break apart the object being magnified.

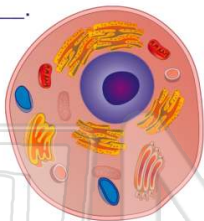
(A)



Name _____ Class _____ Date _____

- 1 The **structures** that are **within a cell** are known as _____.

A cell walls
B cytoplasm
C organelles
D the nucleus



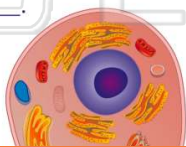
- 2 All _____ cells have a **cell wall**.

A plant
B animal
C bacteria
D protist



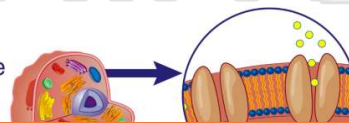
- 3 The **outer layer** of an **animal cell** is called the _____.

A cell wall
B cell membrane
C nucleus
D nuclear membrane



- 4 The **cell membrane** contains **pores** that allow materials in and out of the cell.

A true
B false



5



PREVIEW

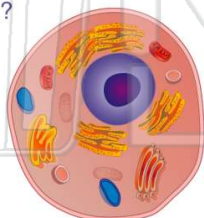
7

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

9

- Which **cell structure** is located in the **cytoplasm** of a cell?

A cell wall
B cell membrane
C ribosomes
D pore



10

- Which **organelles in the cytoplasm** are known as the **storage compartments**?

A Golgi bodies
B vacuoles
C endoplasmic reticulum
D lysosomes

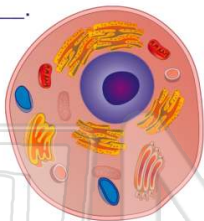




Name _____ Class _____ Date _____

- 1 The **structures** that are **within a cell** are known as _____.

A cell walls
B cytoplasm
C organelles
D the nucleus



(C)

- 2 All _____ cells have a **cell wall**.

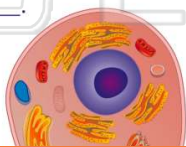
A plant
B animal
C bacteria
D protist



(A)

- 3 The **outer layer** of an **animal cell** is called the _____.

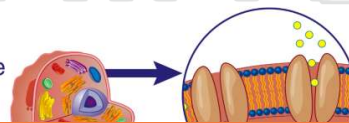
A cell wall
B cell membrane
C nucleus
D nuclear membrane



(B)

- 4 The **cell membrane** contains **pores** that allow materials in and out of the cell.

A true
B false



(A)

5



(D)

PREVIEW

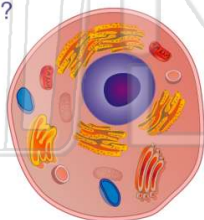
7

Please [Sign In](#) or [Sign Up](#) to download the printable version of this worksheet

(B)

- 9 Which **cell structure** is located in the **cytoplasm** of a cell?

A cell wall
B cell membrane
C ribosomes
D pore



(C)

- 10 Which **organelles in the cytoplasm** are known as the **storage compartments**?

A Golgi bodies
B vacuoles
C endoplasmic reticulum
D lysosomes



(B)



Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Cytoplasm

Cell wall

Cell

Compound microscope

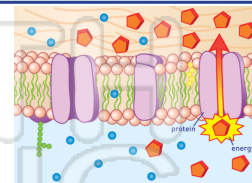
Diffusion

Chloroplast

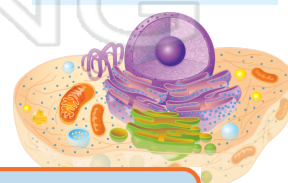
Cell membrane

Active transport

1. membrane proteins that uses energy - the transport of materials through cell



2. organisms - the basic building block of all living



3. regula
layer o

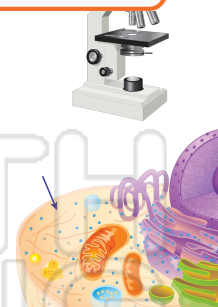


4. other

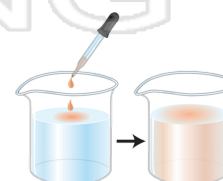
5. contai
produ
photos

6. lens

7. surrounding its organelles; supports and protects the organelles of the cell - a jelly-like substance found inside a cell



8. - the movement of a gas or solute molecules from an area where there are many to an area where there are few; diffusion will occur until the molecules are spread evenly throughout a space





Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Cytoplasm

Cell wall

Cell

Compound microscope

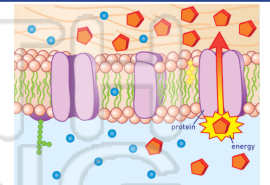
Diffusion

Chloroplast

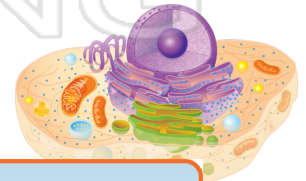
Cell membrane

Active transport

1. active transport - the transport of materials through cell membrane proteins that uses energy



2. cell - the basic building block of all living organisms



3. cell
which
anima



4. cell
organi

5. chl
that ca
sugar

6. con

PREVIEW

Please [Sign In](#) or [Sign Up](#) to download
the printable version of this worksheet

7. cytoplasm - a jelly-like substance found inside a cell surrounding its organelles; supports and protects the organelles of the cell



8. diffusion - the movement of a gas or solute molecules from an area where there are many to an area where there are few; diffusion will occur until the molecules are spread evenly throughout a space

