CELLS UNIT

PDF & DIGITAL FORMATS

2 Peas and a Dog

Middle School Teaching Resources

RESOURCE INCLUDES

- ✓ Ontario Curriculum Aligned
- ✓ Detailed Lesson Plans
- ✓ Readings, Videos, Graphic Organizers, Group Work, Projects, Rubrics
- ✓ Hands-On Science Labs
- ✓ MP3 Audio Files
- ✓ Answer Keys
- ✓ Quizzes & Unit Test
- ✓ Print & Digital Formats

INCLUDED LESSONS

- Introduction - Science Safety
- Cells Introduction - What Are Cells?
- Unit Vocabulary
- The Cell Theory
- Structures and Organelles in Cells
- Plant vs. Animal Cells
- Plant and Animal Cells: Create Your Own Cell (2 Options)
- The Process of Diffusion and Osmosis
- Candy Diffusion Experiment
- Potato Osmosis Experiment
- Unicellular and Multicellular Organisms
- Inquiry Project & Stations
- Organization of Cells
- Organ Systems Infographic and Presentation
- Cell Mid-Unit Quiz
- What is a Microscope?
- Microscope Experiment & Virtual Microscope Experiment
- Dry and Wet-Mount Slides
- Cell Technology and Our Understanding of Cells Stations
- Perspectives on Cell Processes
- Cells Unit Test
- Sub Plans/Unit Review - Bill Nye & Magic School Bus Cells Videos

UNIT ORGANIZATION

GRADE 8 CELLS
ONTARIO CURRICULUM ALIGNMENT

Lesson	2007 Curriculum	2022 Curriculum
Introduction & 1: Cells Interview & Vocabulary	2.1, 2.5	A1.4, A1.5
2. The Cell Theory	3.1	B2.1
3. Structures and Organelles in Cells	3.2	B2.2
4. Plant vs. Animal Cells	3.3	B2.3
5. Create Your Own Cell	3.3	A1.3, B2.3
6. The Process of Diffusion and Osmosis	3.4	B2.4
7. Candy Diffusion & Potato Osmosis Experiments	2.4	A1.2
8A. Unicellular and Multicellular Organisms	2.6, 3.5	A1.5, B2.5
8B. Cellular Organism Inquiry	2.6, 3.5	A1.1, A1.5, B2.5
9. Organization of Cells into Tissues, Organs, and Organ Systems	3.6	B2.6
10. Organ Systems Infographic & Presentation	2.5, 2.6, 3.6	A1.1, A1.5, B2.6
11. Mid-Unit Quiz	Review	Review
12. What is a Microscope?	2.2	Not Included
13. Plant and Animal Cells Microscope Lab	2.2	A1.2
14. Dry and Wet-Mount Slides	2.3	A1.2

CURRICULUM ALIGNMENT

LESSON OVERVIEW

Lesson	Activity Type	Name	Suggested Time
Intro & #1	Class Discussion QR Code Scavenger Hunt	Cells Interview & Unit Vocabulary	1 – 2 Classes
#2	Whole Class Readings & Videos	The Cell Theory	1 – 2 Classes
#3	Whole Class Readings & Videos & Diagrams	Structures and Organelles in Cells	1 – 2 Classes
#4	Whole Class Readings & Videos & Labelling Activity	Plant vs. Animal Cells	1 – 2 Classes
#5	Science Lab (2 options)	Create Your Own Cell – Plant or Animal Cells	2 Classes
#6	Whole Class Readings & Videos	The Process of Diffusion and Osmosis	1 – 2 Classes
#7	Science Experiments	Candy Diffusion & Potato Osmosis Experiments	2 – 3 Classes
	Whole Class Reading	Unicellular and	

UNIT PLAN

INTRODUCTION

What are Cells?

Lesson Overview:
Students will reflect on what they remember about cells, and will interview their peers to see what each other knows.

Materials Needed:
Photocopy a class set or use the provided Google Slides version of the:

- K-W-L chart on Cells
- Introduction to Cells Interviews

Teacher Instructions:

1. To begin the lesson, hand out the K-W-L chart on cells for students. Here, they can record what they know and what they want to know, but they will have to come back to what they have learned after the unit is completed.
2. After, pass out the "Introduction to Cells Interviews" to students. Have students work in pairs and interview one another to better understand what they know about cells.
3. When students complete the interview, have students go back to their assigned seating area to discuss some of the findings.

LESSON PLANS

WHAT'S INSIDE?

WHAT IS "THE CELL THEORY"?

What are Cells?
All living things have cells. Plants, animals, and people. Cells are the basic unit that make up people and all living things. Cells make up an animal or plant's structure, help them breathe, help to take in nutrients and help them get rid of waste. The cells that are in all of these organisms keep us alive and functioning. Without cells, we would n... e cells are so i... ore about th...

ARTICLES

The History of Cell Theory
Before the cell theory was created, the idea of cells was not necessarily common knowledge or talked about, because people could not see them. However, in the 1600s, scientists built and used a microscope to see the very small particles that make up a cell.

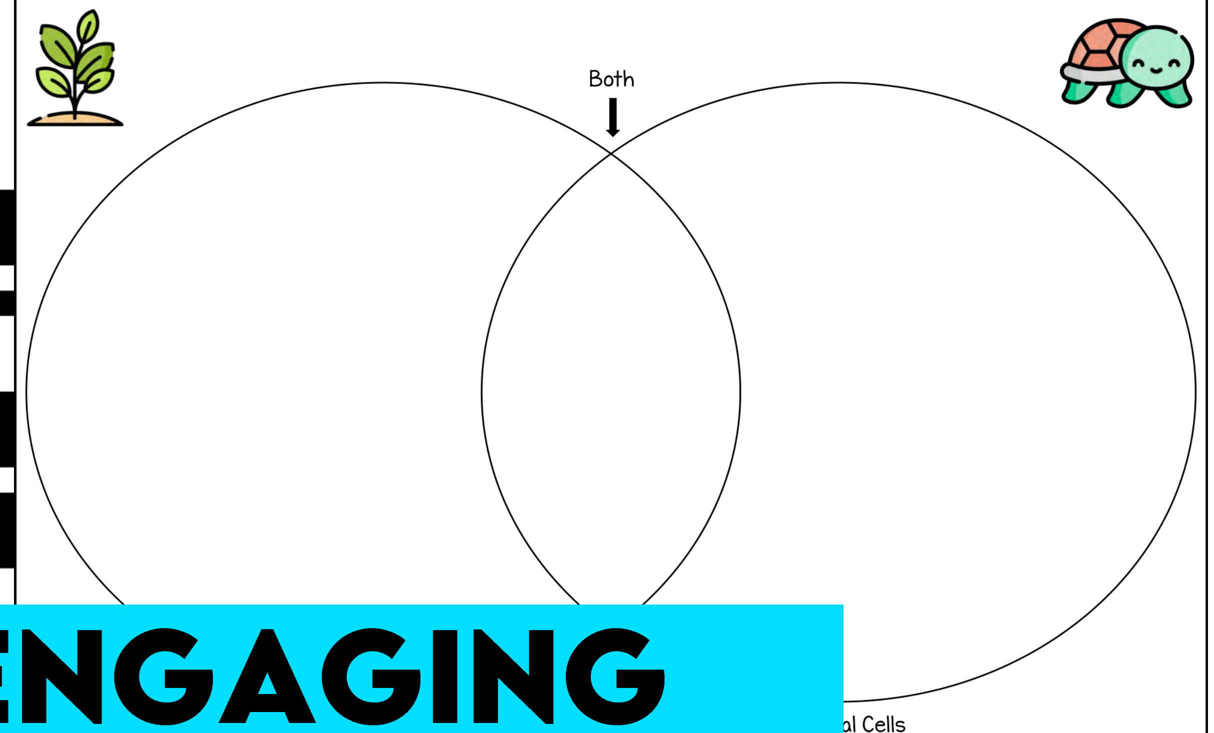
A microscope is a tool that uses light and an eyepiece to magnify an image on a slide to see most (or all) of an object or specimen's components. The magnifying glass in a microscope allows for the human eye to see the tiny cells in a living thing, like those that are in plants and animals.

SCIENCE VOCABULARY WORD #1

Using a phone or a tablet, scan the QR code below to find the hi...

VENN DIAGRAM: PLANT VS. ANIMAL CELLS

Instructions: As you watch the video, note any similarities and differences you hear between plant and animal cells.



ENGAGING ACTIVITIES

WHAT'S INSIDE?

SAMPLE ANSWERS

What are cells?	Cells are the basic unit that make up people. Cells make up a person or an animal's structure, help them bre… tiny, but li… together t…
Where can we find them?	People can… magnifying… eye to viev…
Provide an example of how people…	
Explain the three main points that make up Cell Theory.	1. The ce… 2. All cell… 3. All livi…

ANSWER KEY

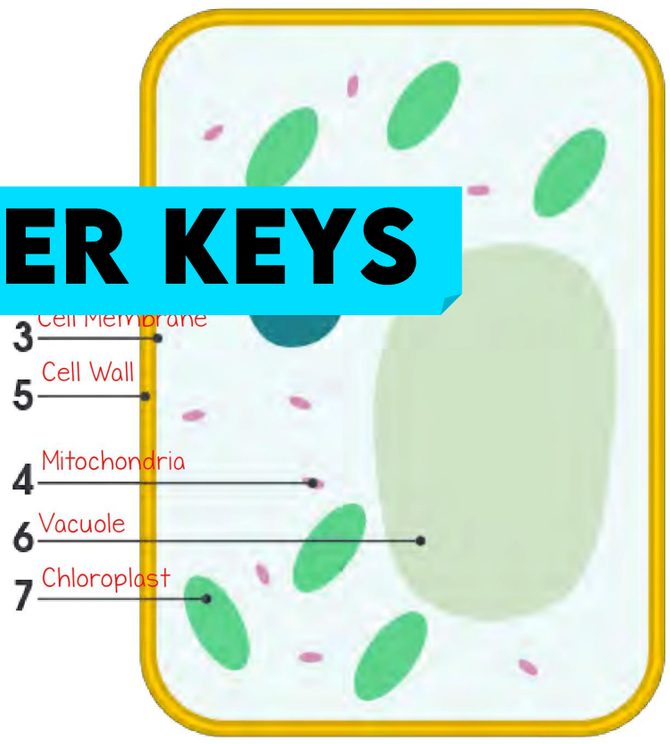
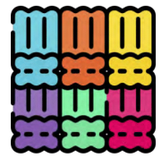


Photo of a Plant Cell

CREATING A CELL



…to be using materials to create a plant or …re that each organelle is a different …e the real-life version.

…se which cell you are going to create (plant …

…, you are going to design and sketch your …

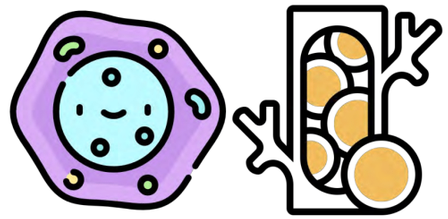
…d sketching your cell, make sure that you …s and sizes for each organelle and that …art of the cell on your sketch.
…sign and sketch, you can begin creating …

…mplete a short reflection on your …t of the science lab graphic organizers …

…equirements:
…the chosen cell.
… the cell that you've included.
…bout:
… certain colour for a certain organelle.
…plant or animal …

…he process.

UNICELLULAR & MULTICELLULAR ORGANISMS WHAT ARE THEY? HOW DO THEY WORK?



Unicellular and multicellular organisms are the basis of all life on Earth. But, what are they on a molecule level? How do they work? How do they each meet their basic needs? Through guided inquiry, you will find out!

Unicellular Organisms	Multicellular Organisms
• Ba… • Dia… • Fu…	

ANSWER KEYS

LABS & INQUIRIES

TEACHER FEEDBACK

"This is hands down the BEST resource I have ever bought on TPT. It makes my life as a teacher so easy as there is very little prep. My students love all the activities – it keeps even my most difficult students engaged and focused. I highly recommend this resource, you will not be disappointed with your purchase!!" - Kaylie C.

INTRODUCTION

SCIENCE SAFETY RULES

1. LISTEN
   - ✓ To ALL the teacher's
   - ✓ Know the location of
2. ATTIRE
   - ✓ Wear
   - ✓ Tie–u
   - ✓ Wear
3. READ
   - ✓ Any la… symbols).
   - ✓ The procedure of yo
4. TOOLS
   - ✓ Handle all tools with c
   - ✓ Inform the teacher there is a spill.
   - ✓ Do not taste test any
5. CLEAN–UP
   - ✓ Thoroughly wash all u
   - ✓ Wash hands with soa

© ht

SAFETY RULES QUIZ

Complete the following true/false questions on safety.

1. When you clean–up, wash your hands with just water.	T	F
2. Before you begin, you must listen to ALL the teacher's instructions.	T	F
…	T	F
… is not important.	T	F
6. Do not bother reading your procedure, just make it up as you go!	T	F
7. Handle all tools with care, especially sharp objects. Make sure to hold microscopes with both hands.	T	F
8. Wear open–toe shoes, and use gloves/goggles as needed.	T	F
9. Read labels on chemicals used carefully (e.g., WHMIS symbols).	T	F
10. Do not tell the teacher if there is a spill or if an item is broken/faulty.	T	F

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SCIENCE SAFETY RULES

K-W-L CHART

Cells

	L
to pic?	What new things did I learn about this topic from the investigation?

INTRODUCTION TO CELLS INTERVIEWS

Instructions: You are tasked with finding one student to interview about their knowledge of cells.

Student Name: _____

Interviewee's Name _____

1. Do you know what a cell is? YES MAYBE NO
2. Do you know how many cells are in …
3. Do … onl…
4. Do … ma…
5. Ar… cel…
6. Do you know if there is only one type of cell or many? YES MAYBE NO
7. Do you know what the importance of cells are? YES MAYBE NO
8. Can you touch or see cells? YES MAYBE NO

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CELLS INTRODUCTION: WHAT ARE CELLS?

LESSON 1 & 2

SCIENCE VOCABULARY

W

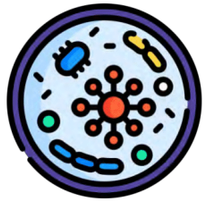
SCIENCE VOCABULARY WORD #1

Using a phone or a tablet, scan the QR code below to find the hidden word.

ANIM

UNIT VOCABULARY

WHAT IS "THE CELL THEORY"?



THE CELL THEORY

What are cells?	
Where can we find them?	
Pro… examp… people can see cells.	
Explain the three main points that make up Cell Theory.	

THE CELL THEORY

…, and people. Cells are the …ng things. Cells make up an …reathe, help to take in …e. The cells that are in all of …ioning. Without cells, we …gan systems. Since cells …sted in learning more … they operate.

…idea of cells was not … about, because people …Os, scientists built and used …cles that make up a cell.

… an eyepiece to magnify an …n object or specimen's …icroscope allows for the … thing, like those that are in

LESSON 3 & 4

STRUCTURES AND ORGANELLES IN CELLS

How are multicellular cells made up?
For each cell, there are diff[illegible] structures
and organelles that help it p[illegible]
which keeps things alive. It
organelles as a subsection o
to perform a specific functi
cell. This helps to make sure
of the cell stay separate an
other cells. A cell has a lot o
structures to keep living thi
the nucleus, cell membrane
chloroplast[illegible]
cytoplasm

What is th
The nucleu
takes up t
to create
cell. The nu
informatio
body.

What is the cell membrane
The cell membrane is impor
to separate the inside of th
outside world. This membra
make sure that external ma
leave the cell.

MATCHING ACTIVITY

A. Nucleus	E. Vacuole
B. Cell Membrane	F. Mitochondria
C. Cell Wall	G. Cytoplasm
D. Chloroplasts	

of a cell, apply
th letters) with the

ne most space.
ell.

____ A goopy substance that holds the parts of the cell in.

____ An organelle that is found within plants and helps facilitate photosynthesis.

____ An organelle that protectors the outer layer of the cell.

____ This part of the cell helps to keep everything separate.

____ A part of the cell that works like a vacuum.

STRUCTURES & ORGANELLES IN CELLS

PLANT VS. ANIMAL CELLS

inue living. While there are
imal cells, there are also

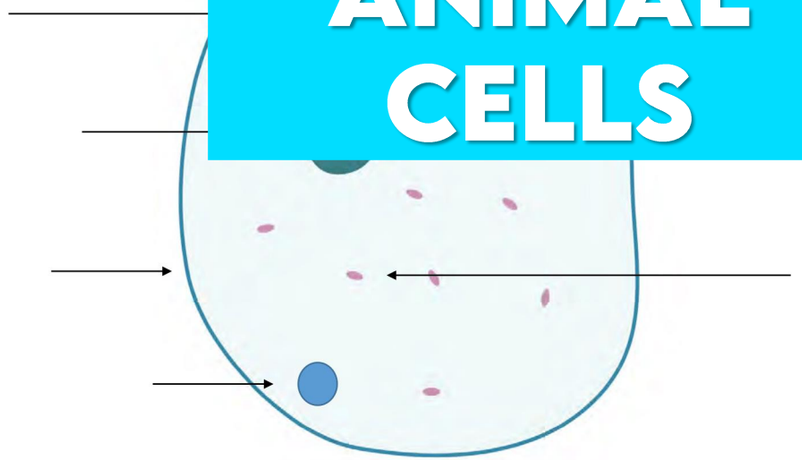
ls
s, a cell membrane, a
e much larger and more
ells do have one. All of
f the two cells. Both plant
s. This organelle works
ure that proteins and
f the cell. In the
also helps to make

rganelles in a plant and
cell wall. The cell wall is
need extra structure and
stand up on their own.
re only found within plant
helps to initiate
ess that uses the energy
sually from carbon dioxide
ls because animal cells can
sources. Animal cells have
mes. This organelle helps
e digested properly.

ANIMAL CELL DIAGRAM

Task: Label the following animal cell diagram with the appropriate terms.

Work Bank	
❑ Cytoplasm	❑ Nucleus
❑ Mitochondria	❑ Cell Membrane
❑ Lysosome	



PLANT VS. ANIMAL CELLS

LESSON 5 & 6

CREATING A CELL

Instructions: You are going
animal cell. Try to make sur
colour and shape to look like

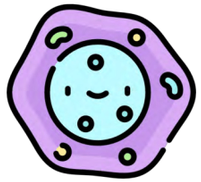
What do I need to do?

1. You need to first choose
   or animal).
2. O
   c
3. A
   in
   y
4. O
   y
5. A
   e

Cell M

- ❑
- ❑
- ❑ Detailed explanations ab
  - Why you chose a c
  - How each organelle
    cell.
- ❑ The final reflection abo

CREATING A VIRTUAL CELL DIAGRAM



Instructions: You are going to be using online software to create a

to create –

nd sketch your

e sure that you
elle. Be sure to

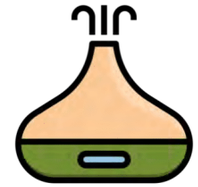
gin creating

on your
aphic organizers.

Creating a Cell Write-Up Requirements:

1. Include the name of the chosen cell.
2. Identify the parts of the cell that you've included.
3. Detailed explanation about:
   - How each organelle is necessary for the plant or animal cell.
4. The final reflection about your thoughts on the process.

DIFFUSION



e smell of the food is left
crystal drink powder (e.g.,
nd saw how the powder
lly dispersed throughout
or a bottle of pop open for
ty flat? If so, then you
rks in such a way that
t from a highly
e there is a lot of particles
where there
helps to

s need to go in and/or get
mbrane. If there is more
he cell than outside of the
the cell.

DIFFUSION VS. OSMOSIS

What is diffusion? How does it work? Provide an example o diffusion	
What is proces osmosis? What is the goal of osmosis? Provide an example of when osmosis occurs.	

PLANT & ANIMAL CELLS: CREATE YOUR OWN CELL (2 OPTIONS)

THE PROCESS OF DIFFUSION AND OSMOSIS

LESSON 7A & 7B

CANDY DIFFUSION LAB

Instructions: You are going to complete an activity on diffusion with candy to see how the proc

Materials Needed:
1. Hard candy
2. A plate
3. A glass of warm water

What do I need to do?
1. Use the science lab graphic questions, as well as the m
2. When you're finished, take side by side in
3. Once the Skit Skittles and o
4. When the exp organizer, inclu

Criteria	Le	
Diffusion Experiment	Stud unprepared during experiment. Student did not participate in the lab.	re exp pa lab, or
Diffusion Write-Up	Lab report is incomplete. Several required elements are missing.	el

© htt

DIFFUSION SCIENCE WRITE-UP

Pre-Experiment Questions

- What question will your experiment try to answer?
- What do you predict

Materials and Procedures

Write down a list of the materials you will need, as well as the procedures you will follow to ensure your candy diffuses.

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CANDY DIFFUSION EXPERIMENT

POTATO OSMOSIS LAB

Instructions: You are going to create an experiment that will help

spoons of salt
oon
owels

Osmosis Science
es section.
four slices
ave already

oard, take two
ay with warm

. Make sure to

water.
two pieces of the potato
water), and two pieces of
te (e.g., normal water).
s long as possible (a
num of 2 days).
ssed, remove the potatoes

g.com

OSMOSIS SCIENCE LAB

Experi

- What occu your expe
- How do yo process o was prese
- How do you think the potatoes could relate to cells?

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POTATO OSMOSIS EXPERIMENT

LESSON 8A & 8B

UNICELLULAR & MULTICELLULAR ORGANISMS

UNICELLULAR AND MULTICELLULAR ORGANISMS

How Do Unicellular Organisms Meet Their Basic Needs Continued ...

In terms of food, an amoeba can capture its food through the
same means that it can mo
something it wants to eat, it
part of the nucleus. Do you
That is how the amoeba car
means how the unicellular o
outsid
amoeb

Photo

DIFFUSION SCIENCE WRITE-UP

Pre-Experiment Questions	
experiment?	
Materials and Procedures Write down a list of the materials you will need, as well as the procedures you will follow to ensure your candy diffuses.	

UNICELLULAR & MULTICELLULAR ORGANISMS WHAT ARE THEY? HOW DO THEY WORK?

Station #2

Explain your unicellular or multicellular organism. Which one is it? What are the parts of its cell? How can you tell?

How does your topi
food or nutrients, h

Where is your topic
climates or in a certain part of the word?

ne basis of all life
evel? How do
asic needs?

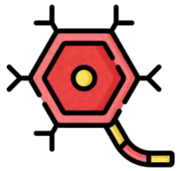
ar Organisms

artish
nails
ogs

INQUIRY PROJECT & STATIONS

LESSON 9 & 10

CELLS, TISSUES, ORGANS, AND ORGAN SYSTEMS VIDE



Instructions: You will learn
up organs, which make up o
you listen to the video, circle
options for each sentence.

The h
tissue
basic
specia
A tissue is a group of
that work (together
particular function. Fo
form epithelial (organ
types of tissues for
heart, stomach, and
also counts as an org
organs are (combine
function, it makes a
example, the digestiv
system.

TISSUES, ORGANS, AND ORGAN SYSTEMS

What are tissues? What are the 4 main	
What are organs? How do they work? Name two organs in the human body.	
What are organ systems? What functions do they perform?	

ORGANIZATION OF CELLS

ORGAN SYSTEM INFOGRAPHIC

Task: You will create an infographic about a specific
m to
he system.
or you can
graphic to
ow about

em.
rpose.

e body?
ystem together?
ound in the organs?
ealthy?
, videos,
d

ystem
mphatic System
productive System

PLANNING YOUR INFOGRAPHIC

Name of your organ system: _____

What is the function and purpose of your organ system?	How do the organs in the system work together?

ORGAN SYSTEMS INFOGRAPHIC & PRESENTATION

LESSON 11 & 12

LESSON #11

Cells

Lesson Overview:
Students will demonstrate t
past few lessons with a quiz

Materials Needed:
❑ Class set of the Mid-Unit

Teacher Instructions:
1. Hand
2. Set a
3. Once

© htt

MID-UNIT CELLS QUIZ

Name: _____

Complete the following True/False questions on cells by circling the correct answer.

1. There are two parts to the cell theory. T F
2. Not all living things are made up of cells. T F
3. T F
4. T F
5. ll. T F
6. Lysosomes are found in animal cells. T F
7. Diffusion occurs as particles move from a low concentrated area to a high concentrated area. T F
8. Osmosis allows water to be transported throughout the cell. T F
9. Unicellular organisms can get nutrients and move, but can't exchange gases. T F
10. Multicellular organisms can't be invertebrates. T F

/10

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CELLS MID-UNIT QUIZ

ALL ABOUT THE MICROSCOPE

What is a microscope?	
Who invented the microscope?	
What is t a mi	
How do microscopes work?	
What is the "stage"?	

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ALL ABOUT THE MICROSCOPE

Photo of a Microscope

?
ht is shined
. The sample
light can
e is usually
omething called the "stage."
olds the object being
the slide. The light from
shines toward the
lens and is magnified. You
through the ocular lenses
known as the eye pieces) to
nple.

g.com

WHAT IS A MICROSCOPE?

LESSON 13

STEPS TO PREPARE YOUR MICROSCOPE

What are the Necessary Steps for this Experiment?

1. Make sure that your spa
   be on or around your wo
2. When the work area is c
   Please be sure to carry
3. After you get the micro
   or workspace.
4. Here, you will want to ha
   to make sure what you s
5. If it is unclear, adjust it
   handles.
6. Next, you will want to tak
   the sta
7. Use the
8. Place a
   place t
9. Put you
   examin
   magnif
   handles to magnify the s
10. As you look through the
    the plant or animal cell.
    around, etc.
11. While you are looking at
    within and draw what yo
12. Note any observations af

MICROSCOPE EXPERIMENT

Hypothesis

you will see with the animal cell?

Do you think there will be similarities or differences?

MICROSCOPE EXPERIMENT

VIRTUAL MICROSCOPE LAB

After examining the two specimens (e.g., plant and animal cells)
write a lab report.

VIRTUAL MICROSCOPE EXPERIMENT

Proced

Which steps
take to se
plant and
cells? Be s

you saw, the connections you
class vs. what you experienced,
fered.

why not?
er?

	Level 4
explore, etc.)	Expectations for Level 3 were achieved. In addition, student searched for other plant and animal cells online to explore or examine.
Lab report is complete. Some elements could use more detail.	Lab report is well-written and organized. Attention to detail is demonstrated.

com

VIRTUAL MICROSCOPE EXPERIMENT

LESSON 14 & 15

DRY AND WET-MOUNT SLIDES

What are Dry-Mount Slides?
When using a microscope, a
or wet. If yo
look at a piec
microscope,
specimen at
microscope v
usually glass,
microscope li
specimen. Sir
for any additi

What are Wet-Mount Slides
Much like with dry-mount s
the cells and particles of a
from your cheek, or it could
can also use something that
syringe to make it wet. Wet
organisms so that you can e
you're putting wet specimen
add a lot of the specimen. T
bit that you put on the slide
level, too, if you can not see

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DRY AND WET-MOUNT SLIDES OBSERVATIONS

Note any observations based on your dry-mount slide.	Note any observations based on your wet-mount slide.

Observations: What are some similarities between the two? Are there any differences? Explain in the box below.

DRY AND WET-MOUNT SLIDES

CELL TECHNOLOGIES

Through research, you will learn about some of the cell technologies that help people better understand cells and cellular processes. Fill
esearch.

CELL TECHNOLOGY REFLECTION

1. Which cell technology was the most interesting to you?

2. How

3. What

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CELL TECHNOLOGY & OUR UNDERSTANDING OF CELLS

LESSON 16 & 17

CELL PROCESS AND PERSPECTIVE ASSIGNMENT

Task: You are going to resea
have beneficial or harmful e
environment. You will preser
choice (e.g., slideshow, infogr
type must be approved by

Possible Topics:

1. Farmers need to decide
   to reduce the need for
   impact h
2. Pesticide
   crops to
   and envi
3. People w
   advance
   changes
   What ar
   disadvan

Assignment R

1. Name of the topic and is
2. Detailed explanation abou
   - How the cells or cell
     the environment.
   - Explain the perspec
3. Source List – keep track
4. Organized presentation t

CELL PROCESS AND PERSPECTIVE ASSIGNMENT GRAPHIC ORGANIZER

Which issue are you researching?	
What is the issue or question being discussed?	

PERSPECTIVES ON CELL PROCESSES

UNIT TEST /20

Name: _____ Class: _____

correct answer from the

a(n) _____.

of the cell

food and nutrients for the cell.

UNIT TEST

Name: _____ Class: _____

Short Answer Questions: Respond to the following questions in sentence format.

13. Explain how unicellular and multicellular organisms meet their basic needs (for example: move, get nutrients, exchange gas, etc.). Please provide an example of each organism. (4 marks)

CELLS UNIT TEST

BONUS FILES

BILL NYE - CELLS

Name: _____ Class: _____

❑ Osmosis	❑ Bricks
❑ Nerve	❑ Die
❑ Trillion	❑ Cells
❑ Structures	❑ Chromosomes
❑ Cell membranes	❑ Alive
❑ Road map	❑ Jobs
❑ Reproduce	❑ Genes
	❑ Cell walls

1. All the plants and
2. Animal cells have
3. Different cells hav
large intestine cell
4. Cells are just like
differenc, though
make new cells.
5. Plant cells have _
_____.
6. Each cell has _____ in it. These are like a ____ _____ for the cell. It tells it what to do and where to go.
7. All plant and animal cells have _____.
8. _____ occurs when cells exchange chemicals with other cells, right through the cell membrane.
9. _____ cells are the only cells that we never replace.
10. Living cells _____ everyday. Animals have them, and plants do too.

THE MAGIC SCHOOL BUS - CELLS

Name: _____ Class: _____

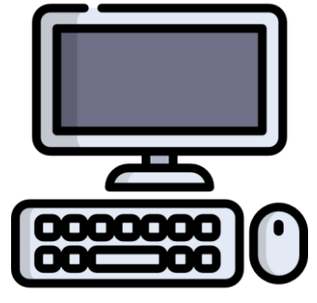
Statement	True or False
In the video, Arnold's skin turns green.	
The skin isn't soft. Rather, it has little flaky pieces called skin cells that break off.	
need food to live and grow.	
Mrs. Frizzle and the class were able to discover that Arnold changed colour because of the food he ate.	
Cells get their food from what a person eats.	
The air we breathe and the amount of exercise we get doesn't impact your cells.	

SUB PLANS OR UNIT REVIEW

LESSON FORMATS

PDF

✓ Individual & Whole Unit



DIGITAL

✓ Google Slides

RESOURCE CAN BE USED IN-PERSON OR ONLINE