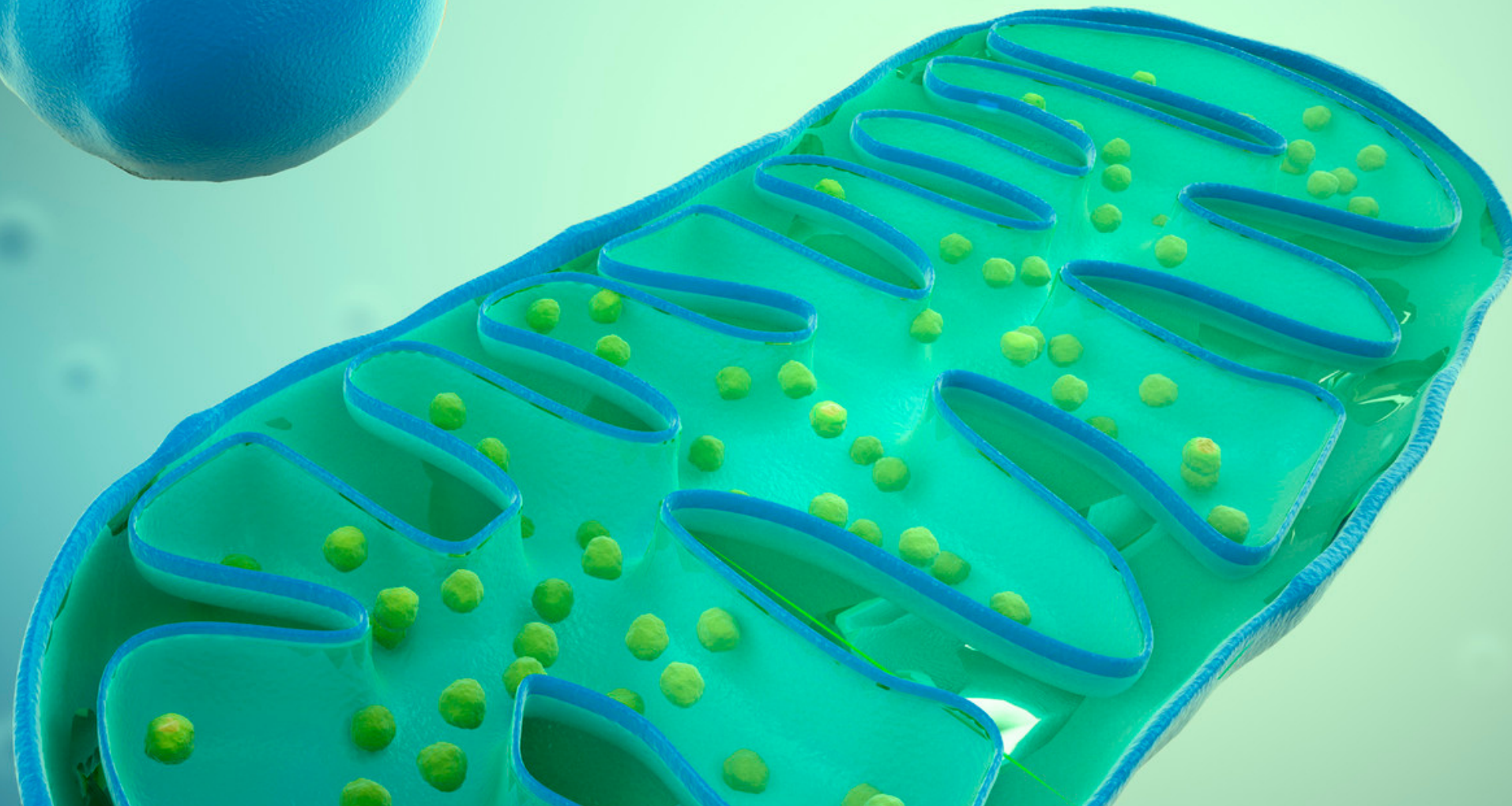


Special Ed

# MITOCHONDRIA



ALSO INCLUDES GOOGLE SLIDES

Special Needs for Special Kids



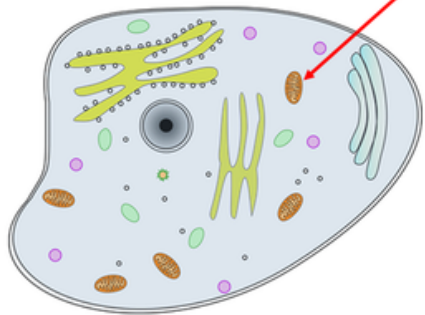


*This unit was created with this guy in mind. He has autism and an intellectual disability. He is a non-reader, has a very short attention span, and struggles to sit still. With some support he is able to do this unit, and enjoys the challenge. He is my tester!!*



# Organelles: Mitochondria

By  
Christa Joy  
Special Needs for Special Kids



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4-5	Vocabulary board
6-9	Vocabulary cards
10-18	Vocabulary cut and paste
19-22	Circle maps
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29-31	Labeling parts of mitochondria
32-42	Labels steps of cellular respiration
43-47	Cloze worksheets
48-58	Assessment
59-60	Terms of Use

Also included in this resource as separate files:

- Lesson plans
- Links and directions to digital activities
- PowerPoint (this is the book in the lesson plan)
- Voice recorded PowerPoint
- Activities in black and white

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This unit contains 8 days of material in print and digital formats. I have included a detailed lesson plan to help you make the most of everything in this unit including how to add some group activities.

It comes in 2 separate files. One in color and one in black and white.



# Mitochondria

## Lesson Plan

### Preparation

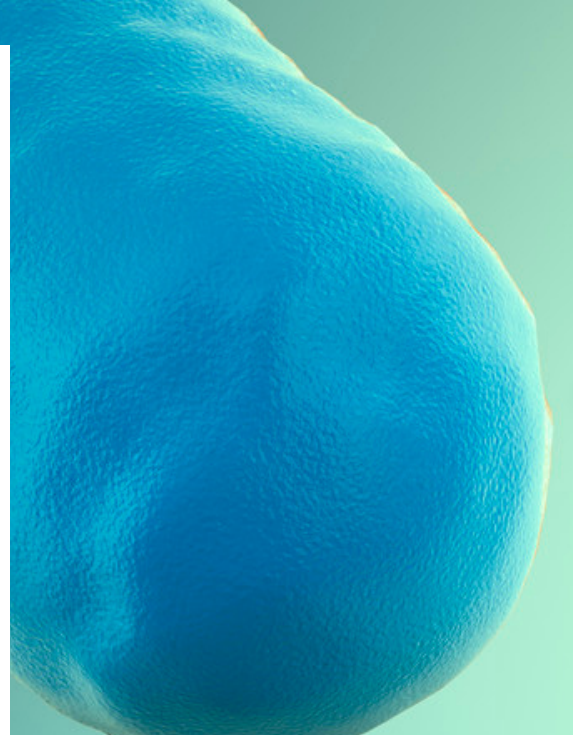
- Print out a vocabulary board for each student to use throughout unit
  - Laminate or place in page protector
- Book
  - Print out, laminate, and bind
  - OR your students can listen to the pre-recorded version
- Vocabulary cards
  - Print out a set of cards onto cardstock and laminate
  - Make one set for each student and also one for the teacher to use in I Spy games

### Preassessment (do day 1 before starting lesson)

- Choose the form of the assessment that best fits the learning level of your students
- Give the assessment to assess what your students may already know
- I cannot emphasize enough how important this step is. If you want to see growth, this preassessment is so important!!

### Teaching Tips

- **Color Coding:** this is a really easy way to add more structure to a matching activity. Outline or color in an empty box or sorting label. Outline or color in the corresponding picture symbols the same colors. Be task.
  - For more info, read more here: <https://specialneedsforspecialkids.org/2015/09/differentiation/>
  - I also have a blog post on differentiating one at <https://specialneedsforspecialkids.org/2018/10/23-ways-easily-and-effectively/>
- **Make your own copies of the activities:** Every day I re-yesterday. For that reason:
  - I often complete the activity myself and often let that I could use year after year.
  - My copies were also helpful as either a model for more support or as a way for more advanced work.

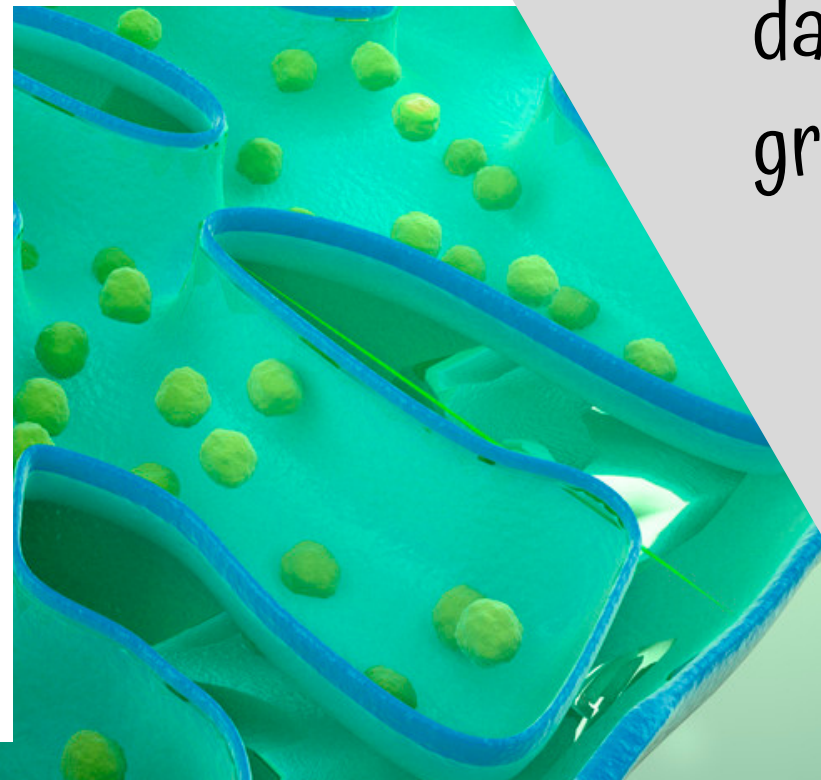


### Day 5

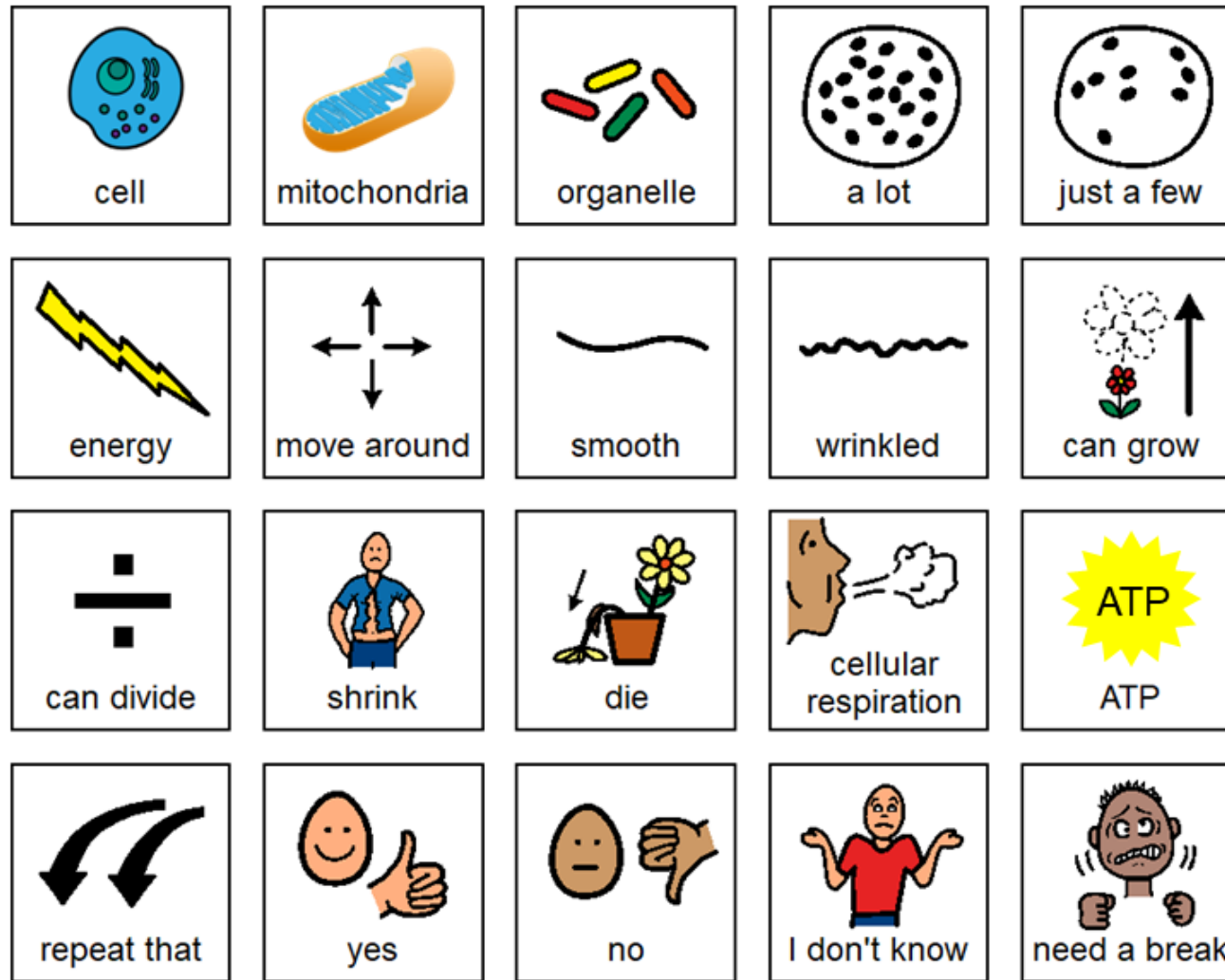
Activity	Notes	Materials
Read or listen to a recording of the book (10 minutes)	<ul style="list-style-type: none"> <li>• Read through the story, asking lots of questions</li> <li>• Continue to make connections between book and vocabulary board</li> </ul>	<ul style="list-style-type: none"> <li>• Book</li> <li>• Vocabulary board</li> </ul>
Vocabulary cards <b>Bean Bag Toss</b> (10 minutes)	<ul style="list-style-type: none"> <li>• Glue the cut apart symbols to the paper plates (one on each plate)</li> <li>• Arrange them around the room</li> <li>• Students toss the bean bag trying to get it to land on a paper plate                             <ul style="list-style-type: none"> <li>◦ Students retrieve the paper plate and share the vocabulary card they retrieved</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Vocabulary cards</li> <li>• Vocabulary cards cut apart</li> <li>• Small paper plates (you can also use pieces of construction paper)</li> <li>• Bean bags</li> </ul>
Sequencing activity review (5 minutes)	<ul style="list-style-type: none"> <li>• Review the sequencing worksheet completed yesterday</li> </ul>	<ul style="list-style-type: none"> <li>• Completed worksheet</li> </ul>
Sequencing activity (10 minutes)	<ul style="list-style-type: none"> <li>• Do the sequencing activity on cellular respiration in <b>plant cells</b></li> <li>• There are 2 versions (use the version you don't use for review if needed prior to assessment)                             <ul style="list-style-type: none"> <li>◦ Version 1 has more picture symbols to support students</li> <li>◦ Version 2 has students complete the cycle with much less support</li> </ul> </li> <li>• Make connections to the book as necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Sequencing worksheets</li> <li>• Scissors</li> <li>• Glue</li> </ul>
Sharing (10 minutes)	<ul style="list-style-type: none"> <li>• Each student shares their finished worksheet with the group using the communication method of their choice</li> </ul>	<ul style="list-style-type: none"> <li>• Completed worksheet</li> <li>• Communication devices</li> </ul>

### Quick Look

Day	Activity
1	<ul style="list-style-type: none"> <li>• Book</li> <li>• Vocab cards introduction</li> <li>• Circle map</li> </ul>
2	<ul style="list-style-type: none"> <li>• Book</li> <li>• Vocab cards activity</li> <li>• Labeling activities</li> </ul>
3	<ul style="list-style-type: none"> <li>• Book</li> <li>• Vocab cards activity</li> <li>• Matching activities</li> </ul>
4	<ul style="list-style-type: none"> <li>• Book</li> <li>• Vocab cards activity</li> <li>• Sequencing activities</li> </ul>
5	<ul style="list-style-type: none"> <li>• Book</li> <li>• Vocab cards activity</li> <li>• Sequencing activities</li> </ul>
6	<ul style="list-style-type: none"> <li>• Book</li> <li>• Vocab cards cut and paste</li> </ul>
7	<ul style="list-style-type: none"> <li>• Book</li> <li>• Vocab cards activity</li> <li>• Close worksheets</li> </ul>
8	<ul style="list-style-type: none"> <li>• Assessment</li> </ul>



There is a 6 days lesson plan with tips and detailed plans for each day with individual and group activities.



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This unit comes with a vocabulary board.

Vocabulary boards are great for ALL students to assist with participation and engagement in group discussions.

Tips on how to use in the unit!!



## mitochondria

Organelle that turns food into energy the cell can use. Powerhouse of the cell.



## organelle

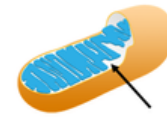
Things inside the cell that have their own membrane and special job to do.



## cristae



## matrix



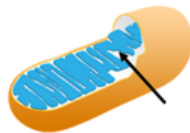
## outer membrane

**Smooth** outer surface of mitochondria.



## inner membrane

**Wrinkled** membrane inside the mitochondria.



## ribosomes



## cellular respiration



**Smooth** outer surface of mitochondria.

made.

**Wrinkled** membrane inside the mitochondria.

**Unique** genetic code that tells mitochondria what to do.

Organelles created in the nucleus that are like factories to create proteins for the cell to use.

Organelle that turns food into energy the cell can use. Powerhouse of the cell.

Things inside the cell that have their own membrane and special job to do.

The energy that is produced in the mitochondria that the cell can use.

Occurs the mitochondria. Takes food, combines it with oxygen to make energy.

Fluid-filled inside of mitochondria where ribosomes and DNA are found.

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## mitochondria

Organelle that turns food into energy the cell can use. Powerhouse of the cell.



## organelle

Things inside the cell that have their own membrane and special job to do.



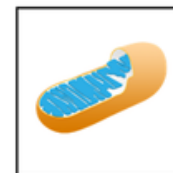
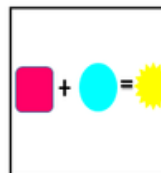
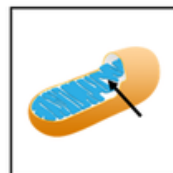
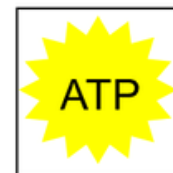
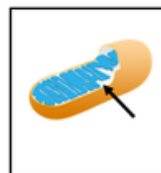
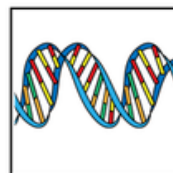
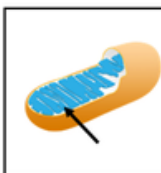
## outer membrane

**Smooth** outer surface of mitochondria.



## inner membrane

**Wrinkled** membrane inside the mitochondria.

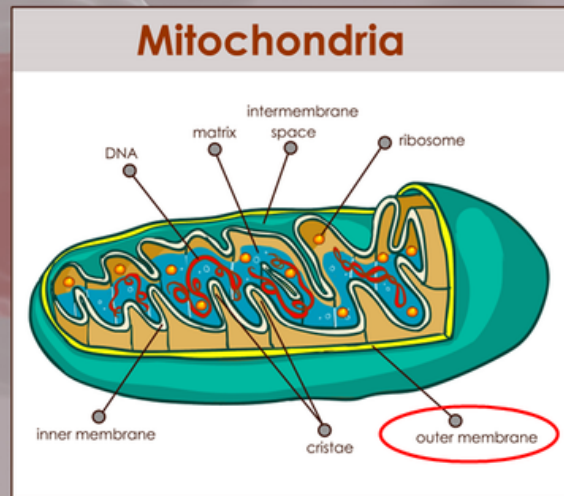


There are 10 vocabulary cards that come in color and black and white.

Included are suggestions for group activities to do with these each day.

There are also individual cut and paste activities included as well.

The mitochondria is surrounded by an **outer membrane**. The outer membrane is smooth and protects the mitochondria from other organelles in the cytoplasm.



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There is a 30-page book with simple text and engaging photos.

It comes in a PowerPoint version as well as a voice-recorded PowerPoint (so you don't have to print it out.) There is also a movie version you can use in google slides.

But what if a cell needs more or less energy over time? If a cell needs more energy than it did before, the mitochondria can grow and actually divide making even more mitochondria inside the same cell.

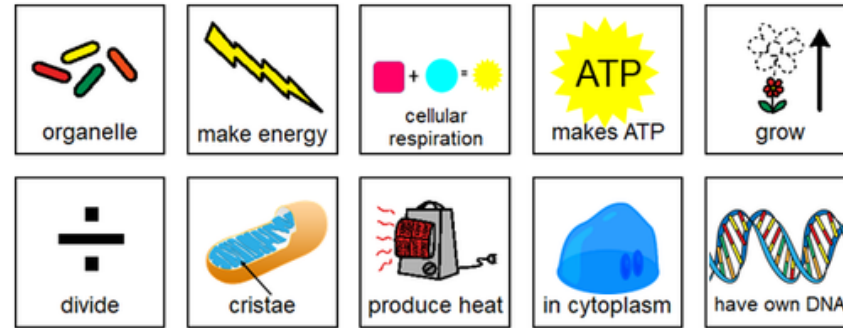


©Christa Joy, SNSK

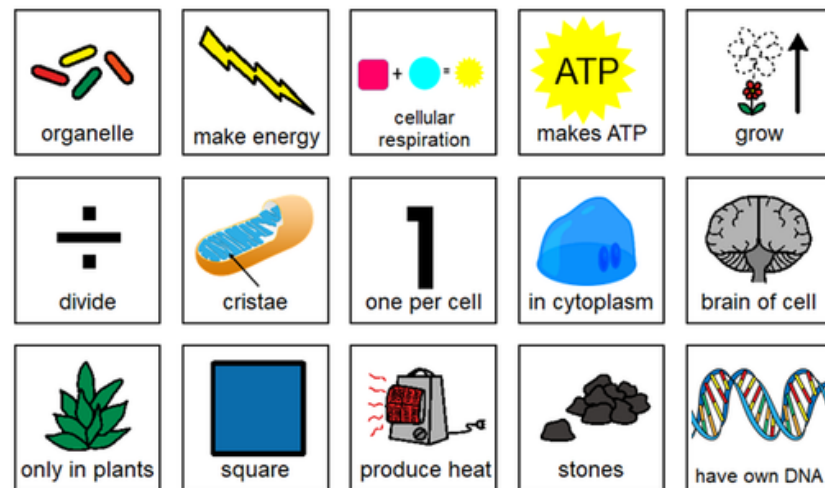


Errorless version

Cut apart pictures and place in circle map about mitochondria.



Cut apart pictures and place in circle map **ONLY IF** they relate to mitochondria.



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There is a circle map that reviews the main facts from the book.

Circle maps are a great way for students to see the concept at a glance. There are 2 versions:



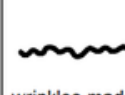



- One is errorless
- One has wrong answers mixed in students will have to set aside









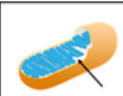


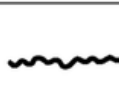
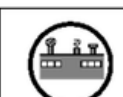

Match the function to each part of the mitochondria.

 outer membrane	 inner membrane
 cristae	 matrix
 DNA	 ribosomes

Match the function below to the part of the mitochondria responsible.

 blueprint for mitochondria	 makes proteins	 wrinkles made of cristae
 protects mitochondria	 cellular respiration	 holds ribosomes and DNA

Draw a line matching the part of the mitochondria to its function.

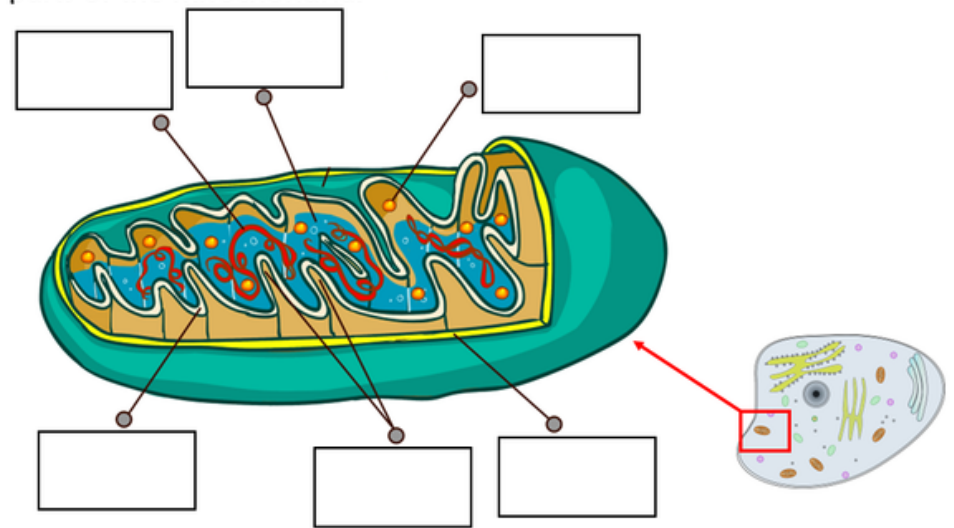
 outer membrane	 blueprint for mitochondria
 inner membrane	 protects mitochondria
 cristae	 makes proteins
 matrix	 cellular respiration
 DNA	 wrinkles made of cristae
 ribosomes	 holds ribosomes and DNA

There is a matching activity, matching part of the mitochondria to its function.

There are 2 versions

- cut and paste
- drawing a line (includes differentiated version)

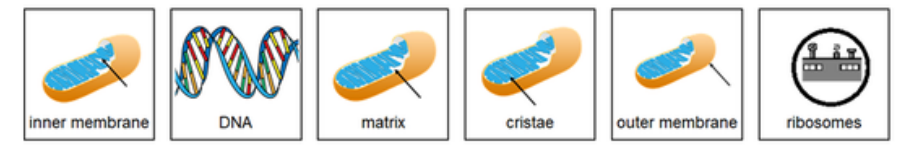
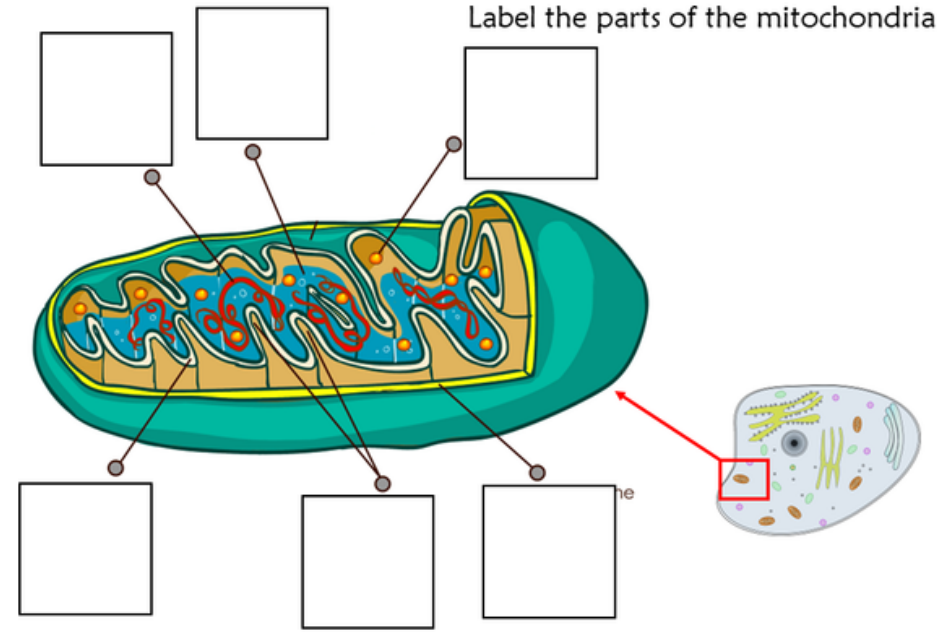
Label the parts of the mitochondria.



DNA	ribosome	Inner membrane
Outer membrane	cristae	matrix

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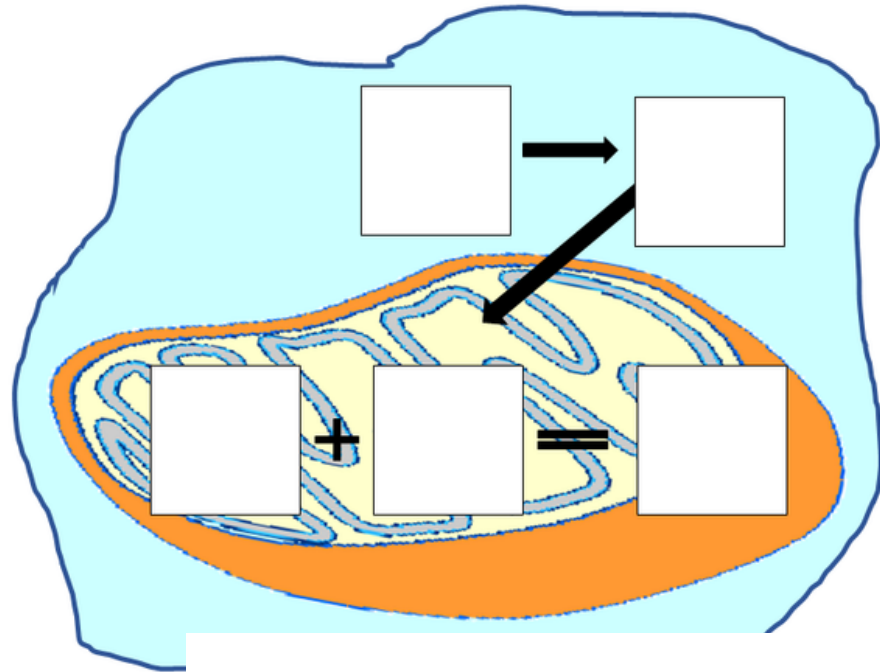
Label the parts of the mitochondria.


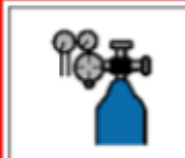





Students will label parts of the mitochondria. There is an option with words only and one with pictures. Suggestions for differentiation are included.

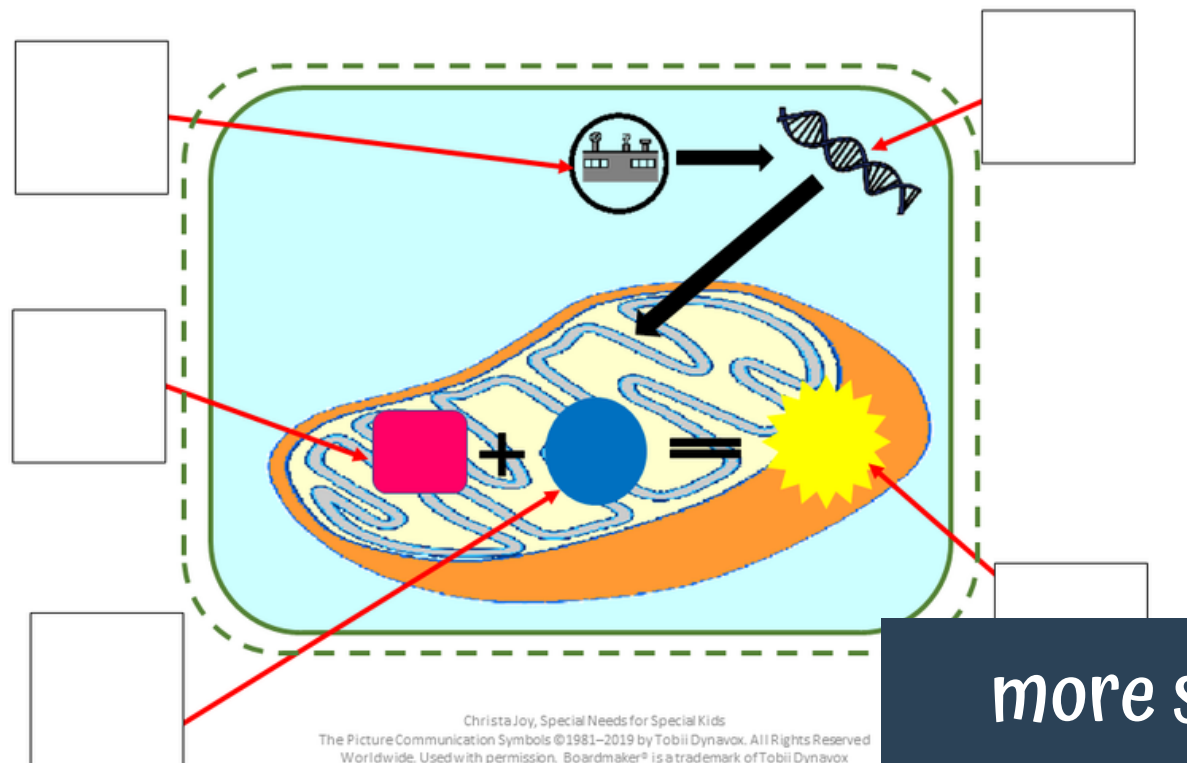


Create **cellular respiration** inside the mitochondria in an **animal** cell.



 ribosome	 oxygen
 protein	 glucose
 ATP ATP	

Label the parts of **cellular respiration** inside the mitochondria in a **plant** cell.



more support

Students will label the steps of cellular respiration in both plant and animal cells. There are 2 versions with different levels of picture support.

## Mitochondria

1. The mitochondria is located in the  of the cell.

2. Each cell has a  number of mitochondria.

3. The mitochondria makes  for the cell.

4. Mitochondria can  around inside the cell.

5. If the cell needs more energy the mitochondria can  or .



## Mitochondria

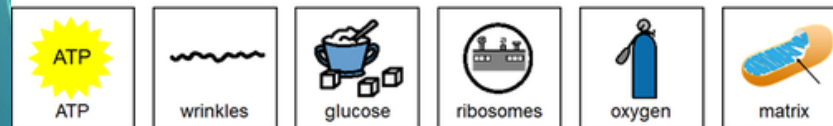
6. The inner membrane is full of .

7.  is made on the surface of the cristae.

8.  and  are combined in cellular respiration.

9. Proteins needed for cellular respiration are made by the .

10. Ribosomes and DNA are found in the  of the mitochondria.



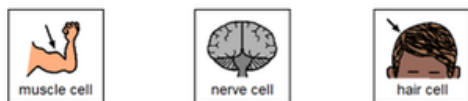
There are 2 fill-in-the-blank worksheets. These allow you to review and find areas that may need to be re-taught before the assessment.



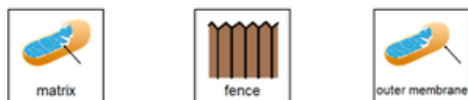
1. What do mitochondria make for the cell?



2. Which type of cell would have the most mitochondria?



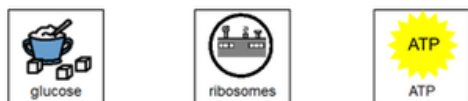
3. What keeps the mitochondria safe inside the cell's cytoplasm?



4. Where are the ribosomes and DNA stored in the mitochondria?

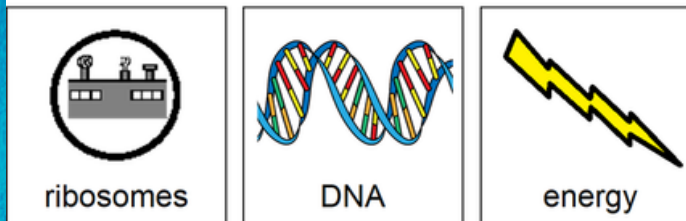


5. What is made on the surface of the cristae?

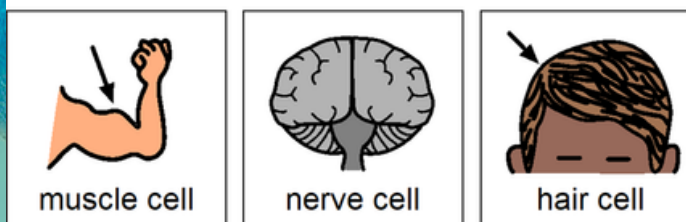


Print onto cardstock or mount on index cards. Cut pictures apart and show student answer choices for each question.

Q 1



Q 2



1. What do mitochondria make for the cell?

- A. Ribosomes
- B. DNA
- C. Energy

2. Which type of cell would have the most mitochondria?

- A. Muscle cell
- B. Nerve cell
- C. Hair cell

3. What keeps the mitochondria safe inside the cell's cytoplasm?

- A. Matrix
- B. Fence
- C. Outer membrane

4. Where are the ribosomes and DNA stored in the mitochondria?

- A. Nucleus
- B. Matrix
- C. Cristae

5. What is made on the surface of the cristae?

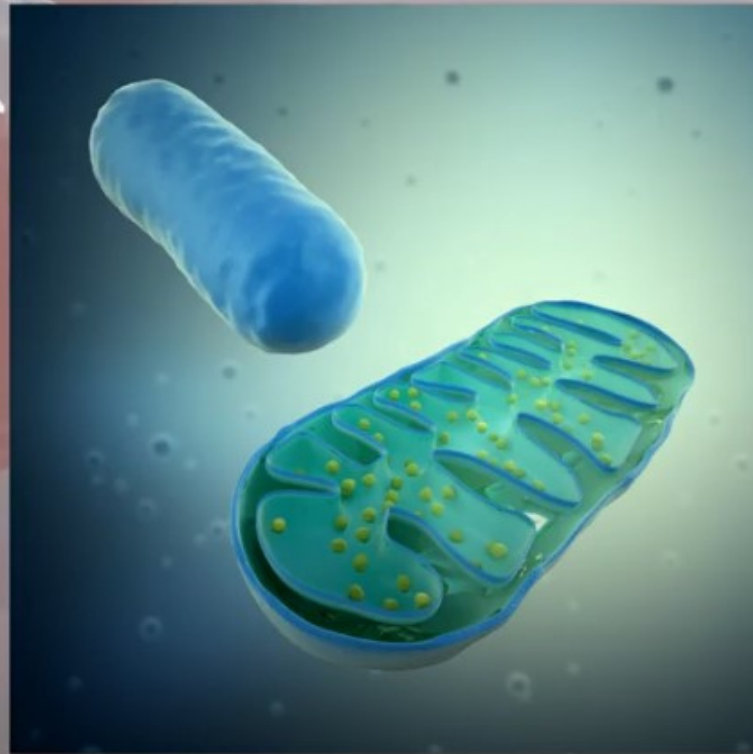
- A. Glucose
- B. Ribosomes
- C. ATP

6. What process does the mitochondria use to make energy?

- A. Photosynthesis
- B. Division
- C. Cellular respiration

There is a 10 question assessment that comes in 3 versions. Answer key included.

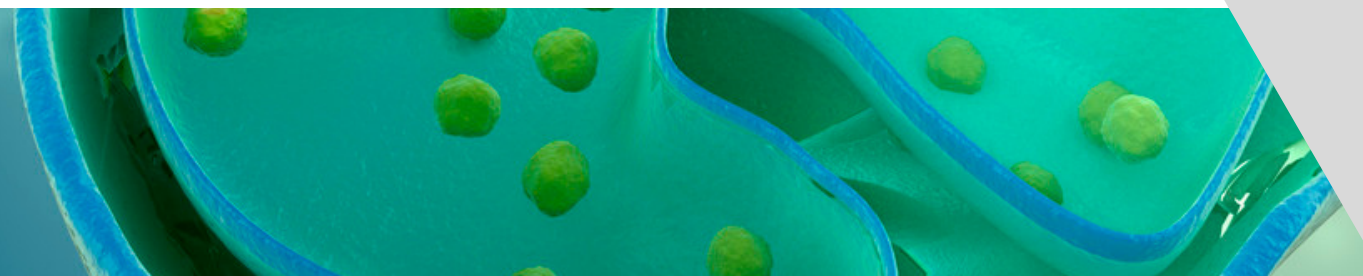
Mitochondria are found in the cytoplasm of the cell. They often have a bean-like shape and can move around inside the cell. Let's look more closely at the structure of mitochondria.



*This unit also includes digital versions of the activities.*

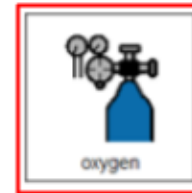
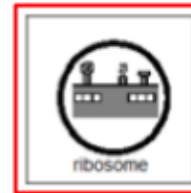
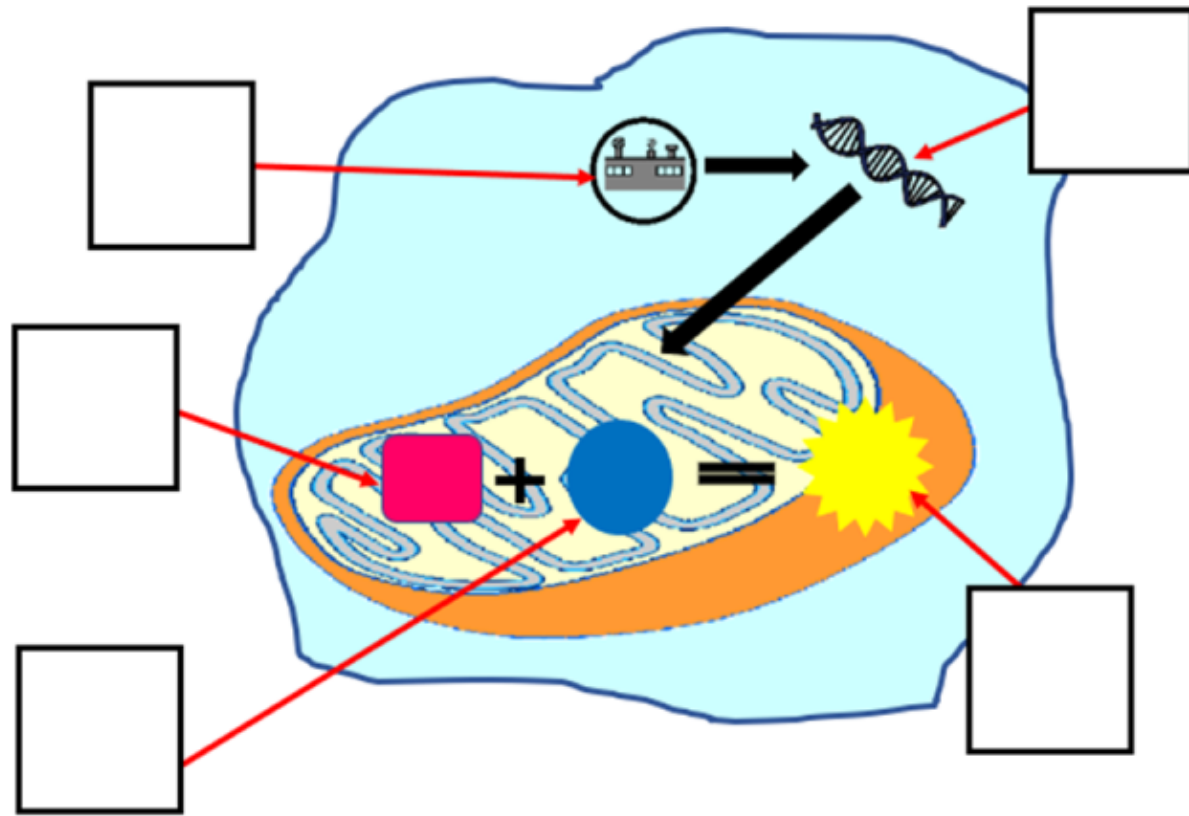
*Students can watch a movie book version of the book rather than printing it out.*

2:11 / 7:44  
©Christa Joy SNSK



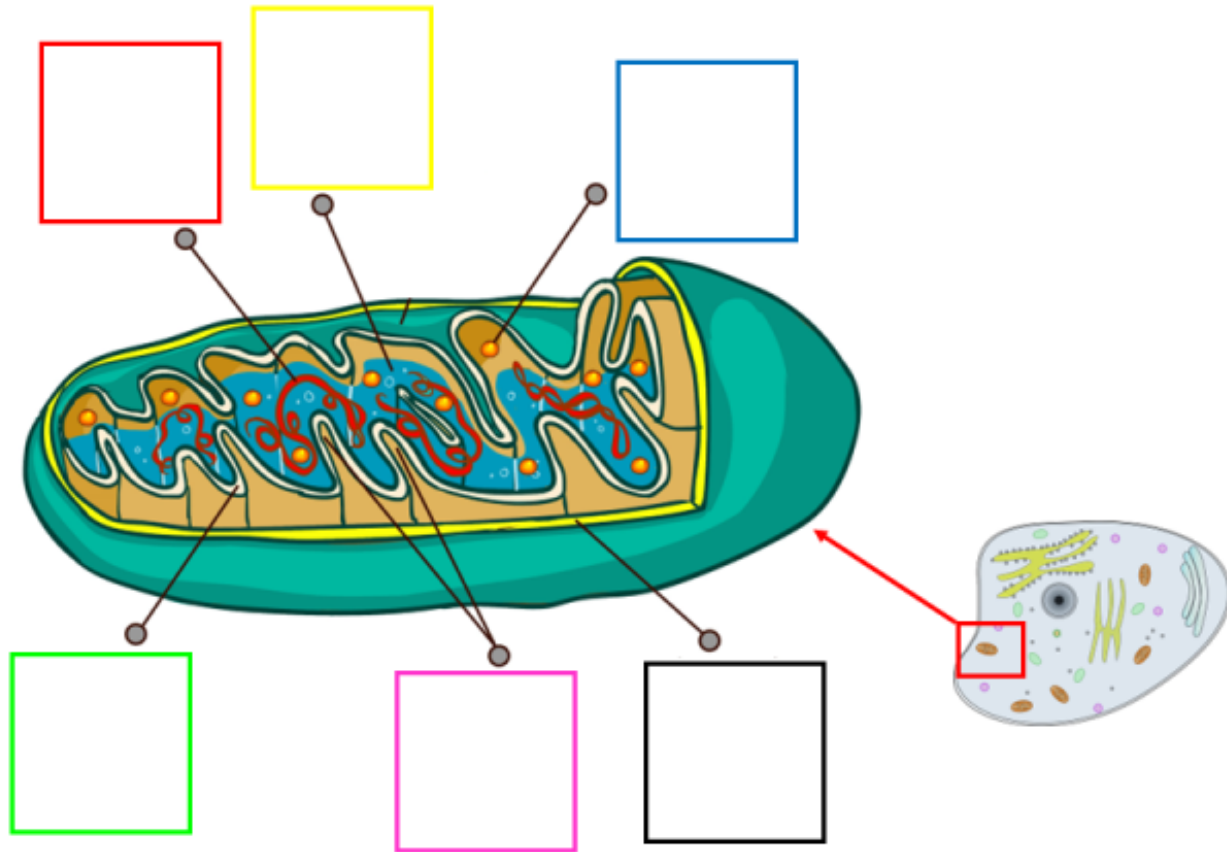


Label the parts of cellular respiration inside the mitochondria of an animal cell.



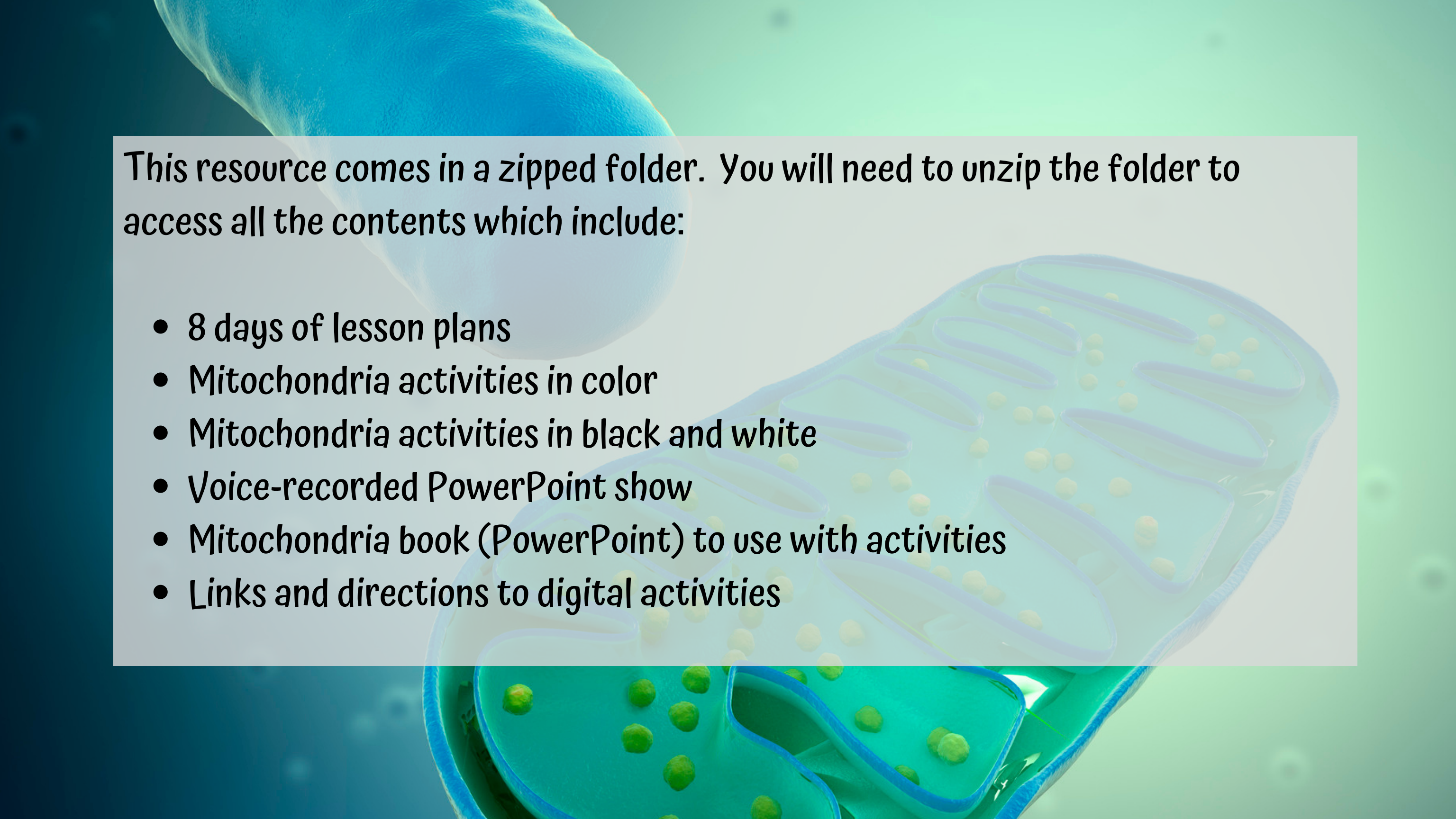
Each activity is set up so students can click and drag answers. No typing is required.

Label the parts of the mitochondria.



The second set of slides uses color for differentiation and extra support for students who may need it. Mix and match slides from both sets to make the perfect set for each student.





***This resource comes in a zipped folder. You will need to unzip the folder to access all the contents which include:***

- ***8 days of lesson plans***
- ***Mitochondria activities in color***
- ***Mitochondria activities in black and white***
- ***Voice-recorded PowerPoint show***
- ***Mitochondria book (PowerPoint) to use with activities***
- ***Links and directions to digital activities***



*This is a focused unit for students who need more practice with organelles in the cell.*

*I also have a Biology bundle that is an overview of the cell that includes mitosis and heredity.*

**CLICK HERE**

