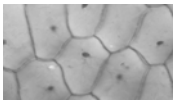


Mitosis: Student Activity Lesson Plan

Subject/Strand/Topic:	Grade(s) / Course(s):	Ontario Expectations:
Science – Reproduction - Mitosis	9 / SNC 1D, SNC 1P	BY1.02, BY1.01

Key Concepts: mitosis, cell division, prophase, metaphase, anaphase, telophase, cell cycle

Link: http://education.uoit.ca/lordec/ID_LORDEC/mitosis/index.html

Required Materials: Pre-Assessment/Answer Key, Student Activity Handout, Student Activity Answer Key, Post-Assessment/Answer Key,

Before Starting:

Introduction (~ 10 minutes including pre-assessment)

1. Introduce the learning object (this online activity will allow you to understand mitosis by exploring the different stages visually through both text and animation).
2. Distribute the pre-assessment quiz and allow 5 minutes to complete; collect
3. Students may work in pairs depending on computer availability and teacher discretion
4. Ensure students are in front of their computers prior to moving on

Student Activity Handout Explanation (~ 5 minutes)

1. Distribute Activity sheet to each student
2. Provide direction on the organization and structure of the Activity sheet as needed; students will complete the activity sheet as they progress through the learning object

<u>Important Points to Tell Students for this Learning Object</u>

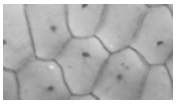
- To navigate to the various sections of the learning object, students should click on the buttons on the left side of the screen.
- Remind students to ensure they are visiting all pages of the learning object by clicking on the arrows at the bottom of each page.

Use of Learning Object with Student Activity Handout (~ 35 minutes)

1. Teacher should circulate throughout the activity and ensure students are on task
2. Provide students with verbal time cues according to the following guidelines:
   - Review a Cell - 3min
   - Cell Cycle – 3 min
   - Interphase – 4 min
   - Prophase – 5 min
   - Metaphase – 5 min
   - Anaphase – 5 min
   - Telophase – 5 min
   - Summary – 5min

Consolidation (~ 10 minutes including post-assessment)

1. Distribute post-assessment quiz and allow 5 minutes to complete; collect
2. Activity sheet can be taken up as a class or collected and marked



Mitosis
Student Activity Pre-Assessment

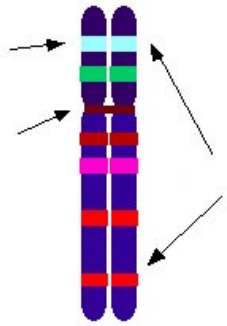
Name: _____
Birthday: _____

____
8

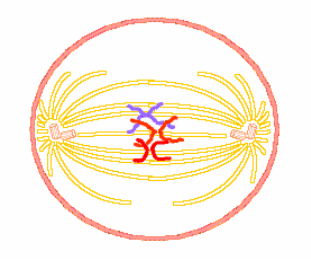
1. What is the following structure? Write your response on the line below it. [1 mark]

_____

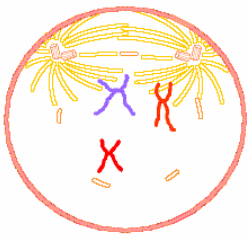
2. In the diagram below, label the following structures: genes, centromere and sister chromatids. Write the word beside the corresponding arrow. [3 marks]



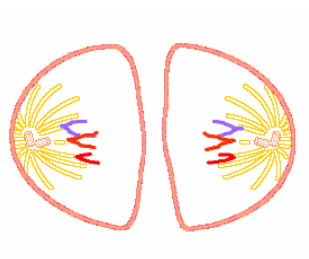
3. Put the following stages of mitosis in order of when they occur by writing the appropriate number under each diagram. [4 marks]



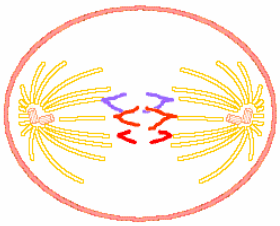
_____



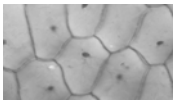
_____



_____



_____



Mitosis
Student Activity Pre-Assessment

Name: _____
Birthday: _____

_____
8

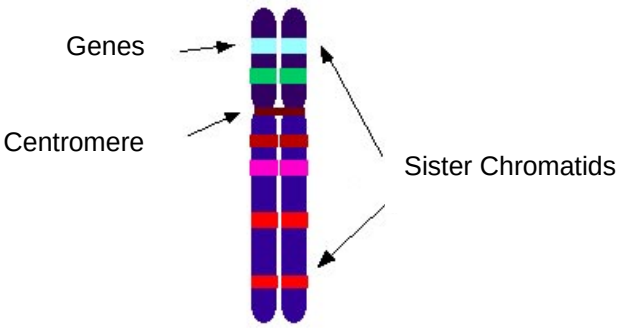
Answer Key

---

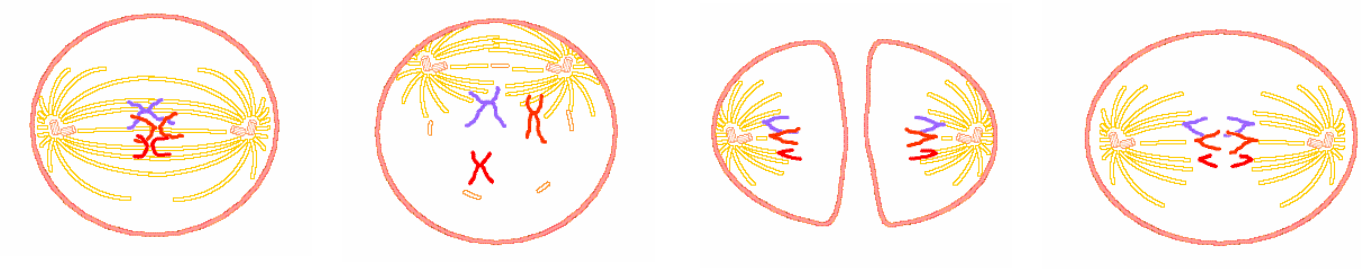
1. What is the following structure? Write your response on the line below it. [1 mark]

Centrioles

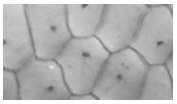
2. In the diagram below, label the following structures: genes, centromere and sister chromatids. Write the word beside the corresponding arrow. [3 marks]



3. Put the following stages of mitosis in order of when they occur by writing the appropriate number under each diagram. [4 marks]



____2____ ____1____ ____4____ ____3____



Mitosis
Student Activity Handout

Name: _____
Date: _____

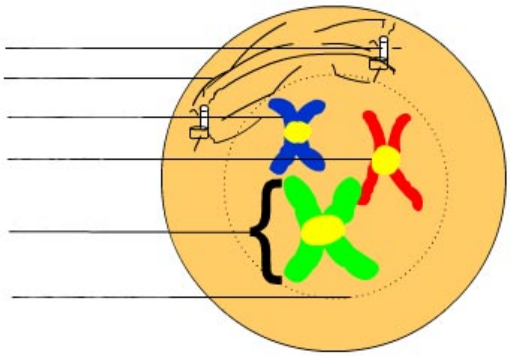
54

LINK: http://education.uoit.ca/lordec/ID_LORDEC/mitosis/index.html
- Select Student's Entrance on the right side of screen to begin

Instructions: Read each section (listed on the left side of the screen) of the Mitosis Learning Object. Answer the questions below as you go.

REVIEW A CELL / CELL CYCLE

1. Label the following parts of the cell that are involved in mitosis. Write the correct response beside the corresponding line. [6 marks]



2. What is the function of spindle fibers? [2 marks]

3. List the stages of the cell cycle. At each stage, briefly explain what occurs. [6 marks]

INTERPHASE

1. Does mitosis occur in all of the body's cells? Justify your response. [2 marks]

2. Explain what the function of mitosis is. [3 marks]

3. The author uses the phrase play me a tune to remember the stages of mitosis. Think of another phrase that you can use to remember the stages of mitosis. [2 marks]

PROPHASE

1. Describe what happens during prophase. [4 marks]

2. Draw a diagram of what a cell looks like after it has undergone prophase. [4 marks]

METAPHASE

1. Describe what happens during metaphase. [3 marks]

2. If you were looking at cells under a microscope, how could you distinguish that the cells were in metaphase? Give 2 reasons. [2 marks]

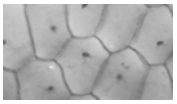
3. Draw a diagram of what a cell looks like after it has undergone metaphase. [4 marks]

ANAPHASE

1. Describe what happens during anaphase. [2 marks]

2. How are the chromosomes able to move to each side of the cell? [2 marks]

3. Draw a diagram of what a cell looks like after it has undergone anaphase. [4 marks]



Mitosis
Student Activity Handout

Name: _____
Date: _____

TELOPHASE

1. Describe what happens during telophase. [4 marks]

2. What is cytokinesis? [1 mark]

3. Draw a diagram of what a cell looks like after it has undergone telophase. [4 marks]

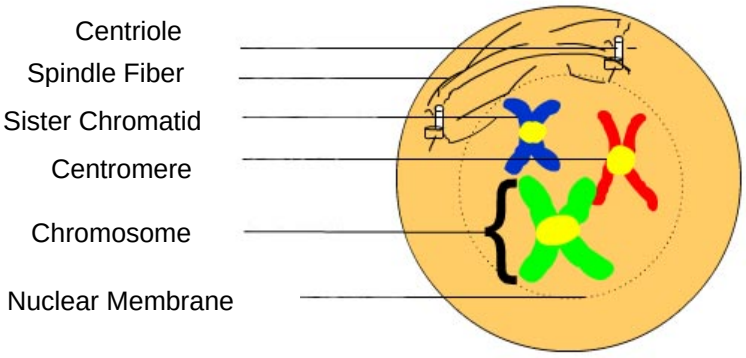
LINK: http://education.uoit.ca/lordec/ID_LORDEC/mitosis/index.html

- Select Student's Entrance on the right side of screen to begin

Instructions: Read each section (listed on the left side of the screen) of the Mitosis Learning Object. Answer the questions below as you go.

REVIEW A CELL / CELL CYCLE

1. Label the following parts of the cell that are involved in mitosis. Write the correct response beside the corresponding line. [6 marks]



2. What is the function of spindle fibers? [2 marks]

Spindle fibers attach to and guide chromosomes during mitosis.

3. List the stages of the cell cycle. At each stage, briefly explain what occurs. [6 marks]

G1 Phase: Cell doing everyday job

S Phase: DNA is replicated

G2 Phase: Cell prepares for mitosis

INTERPHASE

1. Does mitosis occur in all of the body's cells? Justify your response. [2 marks]

No it does not. It does not occur in reproductive cells.

2. Explain what the function of mitosis is. [3 marks]

Mitosis is the process by which the body's cells divide. It replaces dead or damaged cells and allows our bodies to grow.

3. The author uses the phrase play me a tune to remember the stages of mitosis. Think of another phrase that you can use to remember the stages of mitosis. [2 marks]

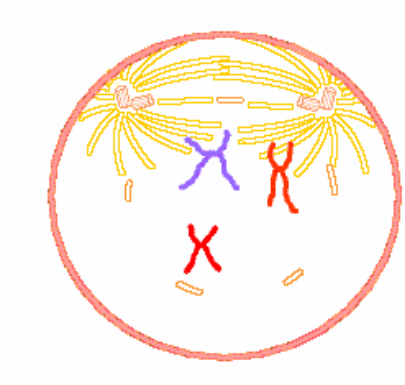
Answers will vary.

PROPHASE

1. Describe what happens during prophase. [4 marks]

During prophase, the chromatin condenses into tight chromosomes. The centrioles begin moving towards the opposite ends of the cell and spindle fibers begin to form. The nuclear membrane begins to dissolve so chromosomes can leave the nucleus.

2. Draw a diagram of what a cell looks like after it has undergone prophase. [4 marks]



METAPHASE

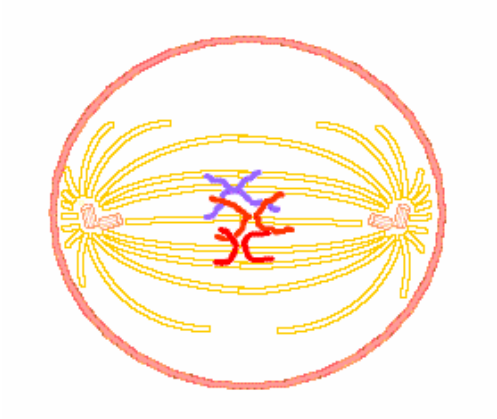
1. Describe what happens during metaphase. [3 marks]

During metaphase, the chromosomes line up along the equatorial plate of the cell. A spindle fiber from each side attaches to a sister chromatid, to equally divide the chromosomes. The spindle fibers guide the chromosomes to the centre of the cell.

2. If you were looking at cells under a microscope, how could you distinguish that the cells were in metaphase? Give 2 reasons. [2 marks]

The chromosomes would be lined up along the equatorial plate of the cell and the chromosomes appear to be very visible and clear.

3. Draw a diagram of what a cell looks like after it has undergone metaphase. [4 marks]



ANAPHASE

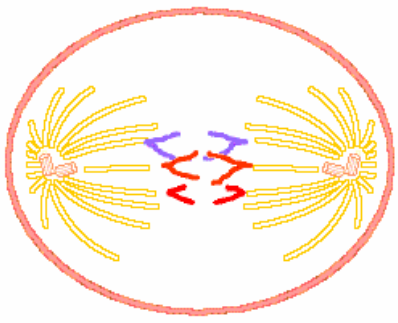
1. Describe what happens during anaphase. [2 marks]

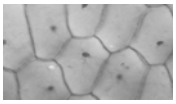
During anaphase, the centromere splits apart and the sister chromatids (now called chromosomes) are pulled by spindle fibers to either end of the cell.

2. How are the chromosomes able to move to each side of the cell? [2 marks]

The spindle fibers shorten, pulling the chromosomes with them.

3. Draw a diagram of what a cell looks like after it has undergone anaphase. [4 marks]





Mitosis
Student Activity Handout Answer Key

Name: **Answer Key for Teacher**

TELOPHASE

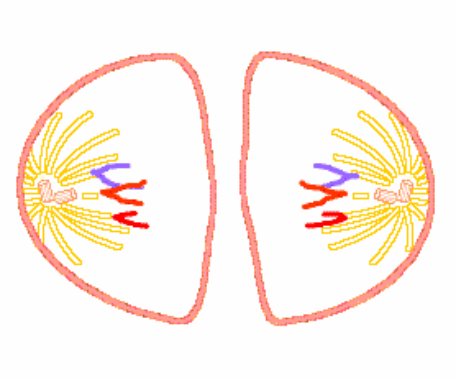
1. Describe what happens during telophase. [4 marks]

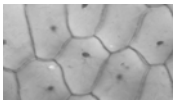
During telophase, the chromosomes, at either end of the cell begin to unwind into chromatin. The spindle fibers dissolve, and a nuclear membrane forms around the chromatin. The cytoplasm begins to divide (cytokinesis) and the cell membrane pinches off forming two identical cells, each with a full set of chromosomes.

2. What is cytokinesis? [1 mark]

Cytokinesis is when the cytoplasm begins to divide.

3. Draw a diagram of what a cell looks like after it has undergone telophase. [4 marks]





Mitosis
Student Activity Post-Assessment

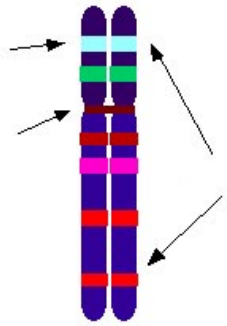
Name: _____
Birthday: _____

8

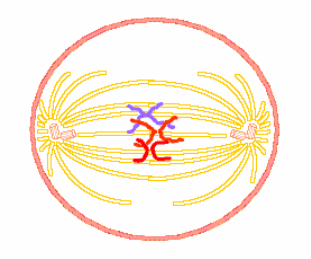
1. What is the following structure? Write your response on the line below it. [1 mark]

_____

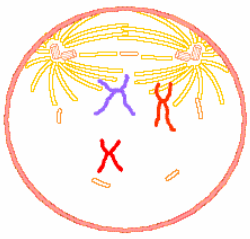
2. In the diagram below, label the following structures: genes, centromere and sister chromatids. Write the word beside the corresponding arrow. [3 marks]



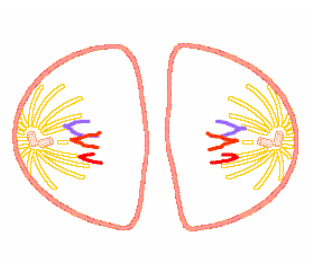
3. Put the following stages of mitosis in order of when they occur by writing the appropriate number under each diagram. [4 marks]



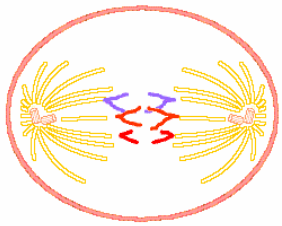
_____



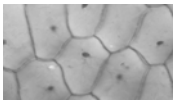
_____



_____



_____



Mitosis
Student Activity Post-Assessment

Name: _____
Birthday: _____

____
8

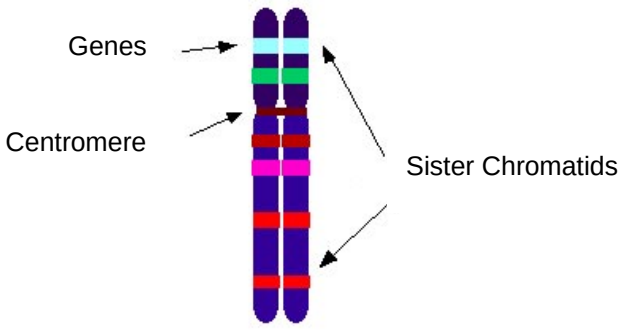
Answer Key

---

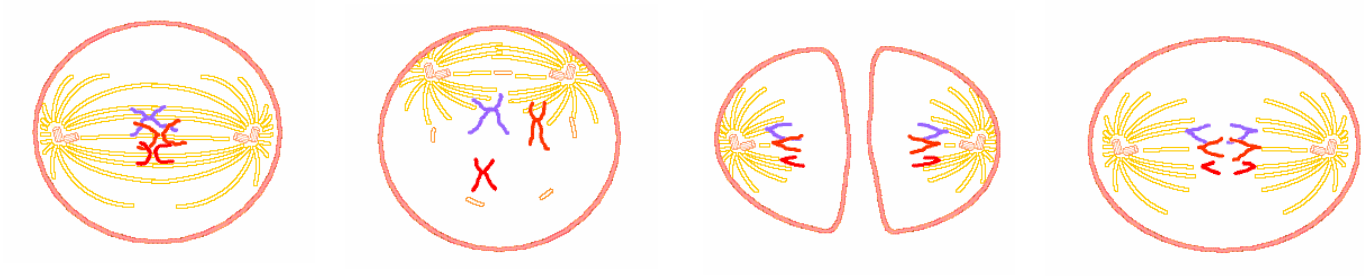
1. What is the following structure? Write your response on the line below it. [1 mark]

Centrioles

2. In the diagram below, label the following structures: genes, centromere and sister chromatids. Write the word beside the corresponding arrow. [3 marks]



3. Put the following stages of mitosis in order of when they occur by writing the appropriate number under each diagram. [4 marks]



____2____ ____1____ ____4____ ____3____