



Differentiated Instruction Example

Learning Station using CHOICE BOARD

Grade 9 Science SNC Biology

INSTRUCTIONS:

- Students rotate through centers
- Students are given **choices of centers** and activities. Not all students are required to complete all learning centre tasks.
- Students usually must complete **1 or 2 mandatory** centers and then are given **choices** on which other stations they would like to complete. Allowing students' options and choices yet still making sure students are meeting curriculum expectations.
- Formative assessment can easily be obtained by observing students working at their stations.

SAMPLE LEARNING STATIONS can be used and altered to fit most curriculum expectations or topics.

1. Frayer Model Station: Verbal-Linguistic
2. Word Sort: Naturalist, Interpersonal
3. Hot Potato: Musical-Rhythmic, Body-Kinesthetic
4. Microscope station: Visual-Spatial,
5. Grab Bag: Verbal/Linguistic, Existential (ponder it)
6. Video/Computer Interactive: Visual/Spatial, Body-Kinesthetic

Flexible groupings – KEY IS KNOWING YOUR STUDENTS

- Students can be placed into groups according to their strengths and weaknesses. The stronger students would aid and provide supports for the learners who require support. A team leader is responsible for all group members to ensure that they all contribute and understand the task or learning objective at hand.
- Using question of the day or exit card strategies are ways to assess student readiness and learning.



STATION 1: WORD SORT

1. As a GROUP decide how you should sort out the following terms.
HINT: You may want to sort the terms in more than two categories. Your cell cycle notes may help if your group needs help.
2. Copy your sorted terms on the paper provided and MAKE SURE that EACH GROUP MEMBER is able to explain WHY you sorted the terms in the manner that you did.

GROWTH
DUPLICATING CHROMOSOMES
PREPARATION
MEMBRANE DISAPPEARS
SPINDLE FIBRES
CENTRIOLES
EQUATOR
ALIGNMENT
PULLED APART
CENTROMERE SPLITS
OPPOSITE POLES
NUCLEAR MEMBRANE FORMS
CLEAVAGE FURROW
CELL PLATE
DAUGHTER CELL



WORD SORT

Name: _____

Please copy how your group has arranged your words on this paper and hand in for assessment at the end of the period.



STATION 2: MANDATORY STATION

Introduction:

In this activity you will be examining prepared slides of an onion root tip to identify cells that are dividing. Since these slides are prepared, the cells are essentially frozen in time and you will not have the opportunity to watch a single cell divide from prophase to telophase.

The onion root tip is an area of rapidly dividing cells. This means that there is a lot of growth in this area and rapidly dividing cells are usually smaller than cells in an area where no cell division occurs.

Procedure: YOU MUST HAND THIS IN FOR ASSESSMENT

DO NOT TOUCH OR ALTER THE MICROSCOPE SETTINGS!!!!

THE SLIDES ARE ALREADY SET UP FOR YOU!!!

1. Look at the four microscopes that are set up. Each microscope (numbered 1-4) has a pointer showing a different stage of mitosis.

2. In the observation section, draw and title each of the phases that you see.

3. Label the chromosomes if they are visible.

4. In the space provided below your diagrams, state one or two reasons that helped you identify which stage of mitosis the onion cell was in.



MITOSIS
OBSERVING CELL DIVISION USING A MICROSCOPE

Name: _____

Observations:

1. _____

2. _____

3. _____

4. _____



STATION 3: HOT POTATO

1. There are cells each showing a different stage of mitosis. Each group member should have 1 cell in their hands before the music starts.
2. Have one group member be the DJ to start and stop the music.
3. DJ: Randomly start and stop the music.
4. When the music starts group members should pass their cell models clockwise.
5. When the music stops, each member must identify which stage of mitosis their cell model is in and share the information with the rest of the group. Explain how you know which stage your cell model is in.
6. If there are extra models available, trade some in for new ones and start the music again. Continue for at least 5 rounds of hot potato.



STATION 4: FRAYER MODEL

MANDATORY STATION

1. Each member of the group must complete the Frayer model worksheet. (Note there is a backside to the worksheet).
2. Complete all of the sections of the worksheet and then discuss your Frayer models with each other.
3. You must **HAND IN** your worksheets for assessment at the end of class.



Frayer Model Worksheet

| DEFINITION | CHARACTERISTICS of two stages of cell cycle |
|-----------------------|-----------------------------------------------------|
| | |
| DIAGRAM OF CELL CYCLE | DIFFERENCES between Interphase and cell division |
| | |

CELL
CYCLE



Fraye Model

| | |
|------------------------|-------------------------------------------------|
| DEFINITION | COMPARE PLANT AND ANIMAL CELL IN CYTOKINESIS |
| | |
| DIAGRAM Animal cell | DIAGRAM Plant cell |
| | |

CYTOKINESIS



STATION 5: GRAB BAG

In the bag there are many terms that relate to mitosis.

1. Sit in a circle.
2. One person begins and draws a word or term out of the bag.
3. You must think of a sentence that has the word or term in it that relates somehow to Mitosis.
4. Group members discuss the sentence you have chosen.
5. Once everyone agrees that the sentence makes sense in relation to the term have one group member record the sentence on the sheet of paper provided.

WORDS FOR THE GRAB BAG

| | |
|-------------------------|------------------|
| CYTOKINESIS | INTERPHASE |
| PROPHASE | METAPHASE |
| ANAPHASE | TELOPHASE |
| MOTHER CELL | DAUGHTER CELLS |
| CELL DIVISION | SPINDLE FIBRES |
| CENTRIOLES | 46 CHROMOSOMES |
| CLEAVAGE FURROW | NUCLEAR MEMBRANE |
| SOMATIC CELL | CYTOPLASM |
| 23 PAIRS OF CHROMOSOMES | |



GRAB BAG

Name(s): _____

Group constructed sentences:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____



STATION 6: MITOSIS VIDEO

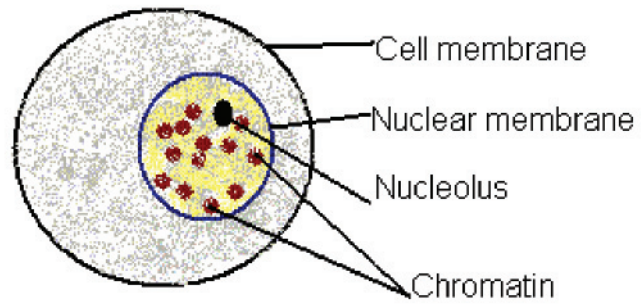
1. Go to the website
http://highered.mcgraw-hill.com/sites/0072437316/student_view0/chapter11/animations.html#
2. Click on Mitosis and Cytokinesis and watch the video
3. Go to the website <http://www.cellsalive.com/mitosis.htm>
4. On this site you can watch the entire cell cycle uninterrupted and then look at specific stages of mitosis frozen in time by clicking on the name.
5. Complete the worksheet provided by stating what happens in each stage of mitosis beside the diagram in point form. HAND IN when completed.

STATION 6 WORKSHEET

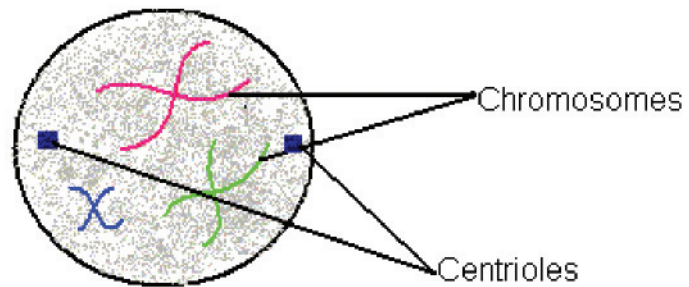
Name: _____

What happens at these stages?

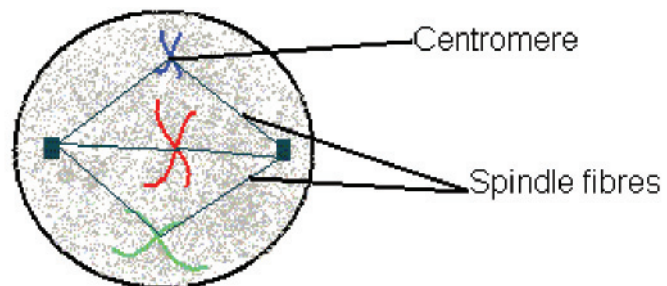
1. Interphase



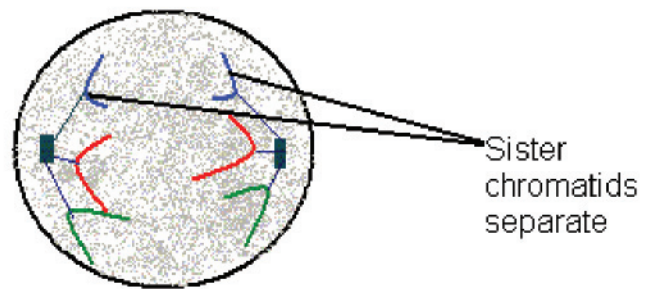
2. Prophase



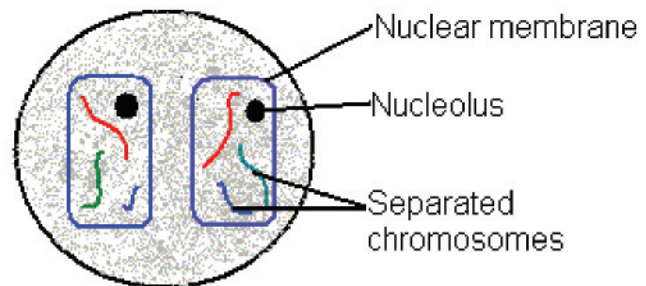
3. Metaphase



4. Anaphase



5. Telophase



Cytokinesis