

Name KEY
Hour _____
Date _____

Demonstrating Cell Cycle/Mitosis with Pipe Cleaners Group Activity Assessment Questions Checklist

Assessment Questions

- How many cell(s) are we beginning with? 1 cell
- What type of cell (body or sex) is being represented in the model? body cell
- What is another scientific name for a body cell? Somatic cell
- What do the blue items in the model represent? Paternal Chromosomes
- Where did the blue chromosomes come from? father's sperm cell
- What do the red items in the model represent? maternal Chromosomes
- Where did the red chromosomes come from? Mother's egg cell
- Are these sex cells (gametes) such as sperm and eggs haploid (n) or diploid (2n) when it comes to their chromosome number? haploid (n) = 2 chromosomes Sperm = 2 blue Egg = 2 red
- What is the name of this first body cell formed from the father's sperm and mother's egg? Zygote
- What is a chromosome made of? 1 DNA molecule & Proteins
- Where in the cell are chromosomes located? nucleus
- How many chromosomes does this starting cell in our model have? 4 chromosomes
- What is the name of the string-like DNA during Interphase? Chromatin
- What do the yellow items in the model represent? Centrioles
- What is the name of the first main stage of the cell cycle? InterPhase
- What is the name of the first part (sub-stage) of Interphase? G₁ Growth 1
- What events occur during G₁ of Interphase? Cell grows in size, organelles (centrioles) double in#
- What happens to a cell if it grows too large? Stops growing, divides, or dies
- Which size cells can more efficiently supply nutrients, expel wastes, and communicate? small cells
- Does the surface area to volume ratio change as a cell increases in size? If so, how?
Yes, SA/V decreases because volume increases faster than surface area
- What is the difference between surface area and volume in relation to cells?
Surface Area - Pathways/Doors for materials to enter/exit cell
Volume - Distance materials have to travel to get in/out of cell
- An effective cell has high surface area and low volume.
- Demonstrate what happens during G₁ of Interphase. Centrioles (yellow) double from 2 to 4

What is the name of the second part (sub-stage) of Interphase? S Synthesis

What event occurs during S of Interphase? DNA replication (DNA is copied)

Demonstrate what happens during S of Interphase. Show red/blue sister chromatids of chromosomes

How many chromosomes are in the cell after S of Interphase? 4 (stays same) each chromosome now has sister chromatids

What is the name for the identical halves of each chromosome formed from DNA replication in S of Interphase?
Sister chromatids

What is the name of the structure represented by the bead that holds the sister chromatids together in the chromosome?
Centromere

What term is used to describe a **pair of chromosomes** (such as the large blue and large red chromosomes in the model) having the same traits (eye color, blood type, etc.)? Same size, Different color Pile cleaners

Homologous chromosomes

What is the name of the third and final part (sub-stage) of Interphase? G₂ Growth 2

What events occur during G₂ of Interphase?

Cell continues to grow; Protein synthesis

The cell cycle is regulated by Cyclins and CDK enzymes

If a cell is damaged and cannot repair itself, then programmed cell death or apoptosis may occur.

What could happen to the cell if the cell cycle is NOT controlled? Cancer = Uncontrolled cell division

How are cancer cells different from "normal" cells? Spend less time in Interphase

What is the name of the second main stage of the cell cycle? Mitosis

What is the name of the first phase of mitosis that comes after Interphase? Prophase

What events occur during Prophase?

Centrioles (yellow) begin to move to opposite poles, spindle apparatus forms, Nucleus and nucleolus disappear, Chromatin condenses into visible chromosomes.

Demonstrate the events that occur during Prophase.

Show centrioles moving apart & visible chromosomes forming

What does the spindle apparatus/fibers do? attaches to centromeres & moves chromosomes

What is the name of the second phase of mitosis that comes after Prophase? Metaphase

What events occur during Metaphase?

Chromosomes line up in straight line along middle/equator of cell

Demonstrate the events that occur during Metaphase.

Show red/blue chromosomes randomly in straight line along middle or equator of cell

What is the name of the third phase of mitosis that comes after Metaphase? Anaphase

What events occur during Anaphase?

Sister chromatids separate and move toward opposite poles of cell

Demonstrate the events that occur during Anaphase.

Remove bead and show sister chromatids moving toward opposite poles

What is the name of the fourth and final phase of mitosis that comes after Anaphase? Telophase

What events occur during Telophase?

Sister chromatids (chromosomes) reach the poles
Nucleus/nucleolus both reform at each end of cell
Chromosomes return back to chromatin

Demonstrate the events that occur during Telophase.

Show chromatids at poles & DNA as chromatin like in Interphase

What is the name of the third (final) main stage of the cell cycle? Cytokinesis

How many daughter cells do we have after Cytokinesis? 2 daughter cells

What type of daughter cells (body or sex) are produced from mitosis? body cells

Are these daughter cells formed by mitosis haploid (n) or diploid (2n) when it comes to their chromosome number? diploid (2n) = 4 chromosomes (2 blue, 2 red)

How is Cytokinesis in animal cells different from Cytokinesis in plant cells?

Animal: centrioles Cleavage furrow Completely separates
Plant: No centrioles Cell plate forms in middle Does not completely separate

Are these daughter cells genetically the same or different? Same

How many chromosomes does each daughter cell have in our model? 4 chromosomes

How many chromosomes are in a "normal" human body cell? 46 chromosomes

Which stage of the cell cycle does the cell spend most of its life in? Interphase 90% life

What are two reasons why mitosis is important? growth & repair

Student Name	# Questions Correct / Total Questions Asked	Overall Converted Score or Percentage

Instructor Comments:
