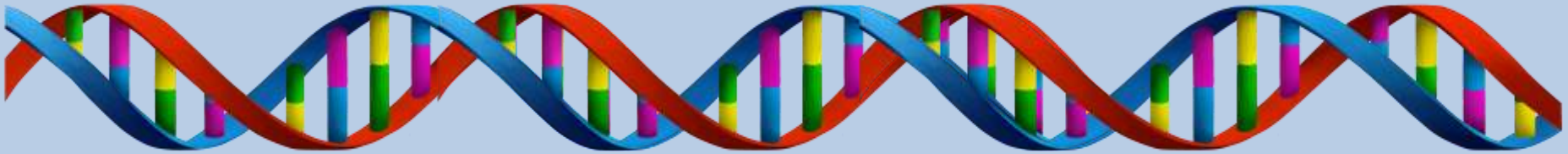
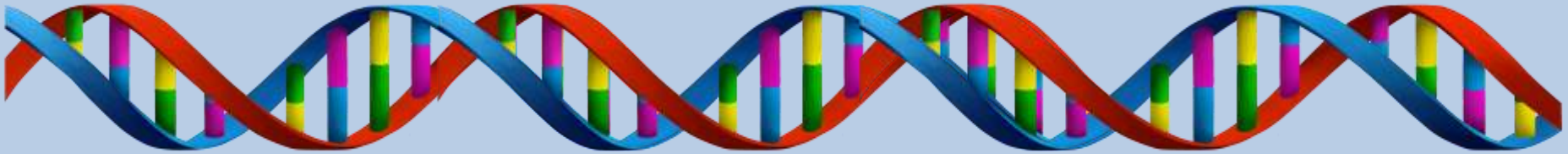


1. What kind of stem cells are found in zygotes, embryos, and adult cells?
2. Which kind of stem cell do planaria have?
3. Which kind of stem cell would be the best kind to MAKE for medical use?
4. What are two types of proteins that cause cells to divide?
5. What would happen if p53 did NOT work?



Logistics

- Unit 5 Assessment
  - TOMORROW

Review Activity

1. Look at the unit objectives
2. On a post it write a question you have about the objective you feel weakest about **DON'T WRITE YOUR NAME**
3. Put the post it on a lab station
4. When you are done with your warm-up, walk around the room and write any answers that you know on post-its

Cell Growth and Division

- 1. Describe why cell size is limited:

Cell Growth and Division

- 1. Describe why cell size is limited: surface area to volume ratio; if a cell is too big it:
  - can't do diffusion fast enough

Cell Growth and Division

- 2. Compare sexual and asexual reproduction:
- 3. Describe the benefits of sexual reproduction:

Cell Growth and Division

- 2. Compare sexual and asexual reproduction:
  - 2 parents vs. 1 parent
  - Genetically unique vs. identical
- 3. Describe the benefits of sexual reproduction: genetic variation increases the chance that the *SPECIES* will survive *changing* environments

Cell Growth and Division

- 4. Explain the role of chromosomes in cell division:
- 5. Describe the main events of the cell cycle:

Cell Growth and Division

- 4. Explain the role of chromosomes in cell division: chromosomes must be duplicated, and separated properly, to make 2 identical daughter cells
- 5. Describe the main events of the cell cycle: the cell grows and prepares to divide, before splitting into two identical diploid daughter cells

Cell Growth and Division

- 6. Describe what happens during the phases of mitosis:

Cell Growth and Division

- 6. Describe what happens during the phases of mitosis:
  - Interphase: DNA replicates (S)
  - PROPHASE: chromosomes condense
  - METAPHASE: chromosomes pulled to middle by spindles
  - ANAPHASE: sister chromatids pulled apart by spindles
  - TELOPHASE: chromosomes unwind in new nuclei
  - Cytokinesis: 2 identical diploid daughter cells

Cell Growth and Division

- 7. Describe how both animal and plant daughter cells split apart after mitosis:

Cell Growth and Division

- 7. Describe how both animal and plant daughter cells split apart after mitosis: during cytokinesis plant cells form a cell plate between the new cells, cell membranes of animal cells pinch in half

Cell Growth and Division

- 8. Describe how the cell cycle is regulated:
- 9. Describe how cancer cells differ from other cells:

Cell Growth and Division

- 8. Describe how the cell cycle is regulated: regulatory proteins; stimulating proteins, like growth factors and cyclin, start cell division, inhibiting proteins, like p53 and BRCA1, cause apoptosis
- 9. Describe how cancer cells differ from other cells: cancer cells divide uncontrollably to form tumors; are unspecialized, and have small cytoplasm, large/multiple nuclei

Cell Growth and Division

- 10. Describe how cells become specialized for different functions:

Cell Growth and Division

- 10. Describe how cells become specialized for different functions: differentiation happens to stem cells to develop specialized cells that have specific structures for specific functions

Cell Growth and Division

- 11. Describe stem cells:
- 12. Describe possible issues associated with stem cell research:

Cell Growth and Division

- 11. Describe stem cells:
  unspecialized cells that can differentiate into specialized cells; totipotent= all cell types, pluripotent = 200+ cell types, multipotent = few cell types
- 12. Describe possible issues associated with stem cell research:
  ethical issues due to varying beliefs about life and death

Today

- **Make sure you have turned in:**
  1. **Mitosis Poster**
  2. **Cancer Biointeractivity**
- **STUDY**