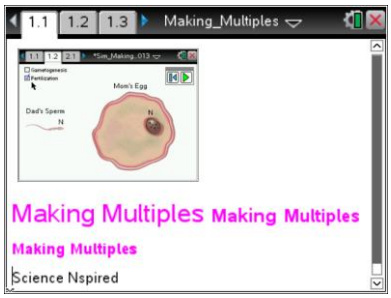
Science Objectives

- Students will compare asexual and sexual reproduction.
- Students will identify the advantages/disadvantages of each type of reproduction.



Vocabulary

- Asexual reproduction
- Sexual reproduction
- Gametogenesis
- Gametes
- Offspring
- Diploid
- Haploid

About the Lesson

- In this lesson, students will:
  - Explore the differences between asexual and sexual reproduction.
  - Simulate each type of reproduction and compare one process to the other.
  - Identify the advantages/disadvantages of each.

TI-Nspire™ Navigator™

- Send out the .tns file.
- Monitor student progress using Class Capture.
- Use Live Presenter to spotlight student answers.

Activity Materials

- Compatible TI Technologies: TI- Nspire™ CX Handhelds, TI-Nspire™ Apps for iPad®, TI-Nspire™ Software

Tech Tips:

- This activity includes screen captures taken from the TI-Nspire CX handheld. It is also appropriate for use with the TI-Nspire family of products including TI-Nspire software and TI-Nspire App. Slight variations to these directions may be required if using other technologies besides the handheld.
- Watch for additional Tech Tips throughout the activity for the specific technology you are using.
- Access free tutorials at http://education.ti.com/calculators/pd/US/Online-Learning/Tutorials

Lesson Files:

Student Activity

- Making_Multiples__Student.doc
- Making_Multiples_Student.pdf

TI-Nspire document

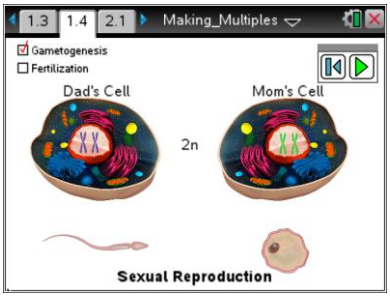
- Making_Multiples.tns

Discussion Points and Possible Answers

Have students read the background information on the student activity sheet or on pages 1.2 & 1.3.

Move to page 1.4

Have students complete the simulation comparing Gametogenesis and Fertilization. In this simulation students should view each process by selecting the box next to the name of the process. They should then select the green play button and watch the simulation.



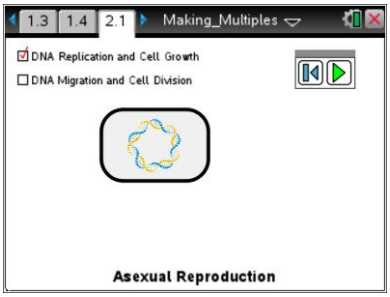
1. After reading the instructions on page 1.4, students should then close the directions box by selecting ☒.

2. Students will be investigating sexual reproduction. Students should select one of the process (Gametogenesis or Fertilization) then select Play to begin the simulation. Once one process is viewed, they should select the other process and then select Play. As the students watch each simulation, they should pay close attention to the number of chromosomes in each cell represented by n & 2n.

Tech Tip: To access the Directions again, select 🔧 > **Directions.**

Tech Tip: To access the Directions again, select menu or **Document Tools (🛠) > Sexual Reproduction > Directions.**

Move to page 2.1.



1. After reading the instructions on page 2.1, students should then close the directions box by selecting ☒.

2. Students will be investigating asexual reproduction. Students should select one of the processes (DNA Replication and Cell Growth as well as DNA Migration and Cell Division) and then select Play to begin the simulation. Once one process has been viewed, they should select the other process and then select Play. As the students watch each simulation, they should pay close attention to the differences between them and the simulation they observed on page 1.4.

Move to page 2.2.

Have students answer question 1-5 in the .tns file, the activity sheet, or both.

Q1. Which type of reproduction produced an exact copy of the parent cell?

Answer: A. asexual.

Q2. Which type of fertilization requires gametes (sperm and egg?)

Answer: B. sexual.

Q3. In which type of reproduction does each parent contribute half of the genes acquired at random by the offspring?

Answer: B. Sexual

Q4. Genes are passed down to offspring on chromosomes. The diploid (2n) number of chromosomes for human body cells is 46. What is the haploid (n) number for sperm and egg cells?

Answer: B. 23

Q5. Bacteria reproduce asexually. Which advantages does this give them? Check all that apply.

Answer: A. reproduce quicker C. require less energy Dc require just one parent

Q6. Asexual reproduction produces clones, which are exact copies of the parent. Why could this sometimes be a disadvantage?

Sample Answer: Asexual reproduction produces less genetic variation to survive environmental changes.

TI-Nspire Navigator Opportunities

Make a student a Live Presenter to illustrate show how to move the sliders. Throughout the activity, monitor student progress. At the end of the activity, collect the .tns file and save to Portfolio.

Wrap Up

- Relate the rapid reproduction of bacteria to common bacterial illnesses.
- Discuss common examples of plant asexual reproduction: grafting, underground stems, bulbs, etc.
- Discuss types of animal asexual reproduction such as fragmentation in starfish, budding in *Hydra*.

Assessment

- Students can design a graphic organizer, i.e.; concept map or compare/contrast to illustrate the differences/advantages/disadvantages of both types of reproduction.