

# Jan. 2C Gr.8: Asexual Reproduction

Content Area: **Science**  
Course(s):  
Time Period: **January**  
Length: **1 Week**  
Status: **Published**

## Unit Overview

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Some organisms can break bits off themselves to form new individuals with the exact same genes. In this concept, you will learn how these organisms generate offspring through asexual reproduction.

## Enduring Understandings

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### Lesson Objectives

By the end of the lesson, students should be able to:

- Describe the different modes of asexual reproduction and identify organisms that reproduce asexually.
- Evaluate the advantages and disadvantages of asexual reproduction.
- Compare and contrast how asexual reproduction differs from sexual reproduction.
- Explain why organisms produced asexually are genetically identical to their parents and siblings.

## Essential Questions

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- **Focus Question**
  - How do organisms grow and develop?
- **Lesson Questions**
  - How do organisms reproduce asexually?
  - How is asexual reproduction different from sexual reproduction?
- **Can You Explain?**
  - How do different organisms reproduce asexually, and what are the advantages and disadvantages of reproducing this way?
- **Overarching Question**

- How do organisms live, grow, respond to their environment, and reproduce?

## **Instructional Strategies & Learning Activities**

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- [The Five E Instructional Model](#)

Science Techbook follows the 5E instructional model. As you plan your lesson, the provided Model Lesson includes strategies for each of the 5Es.

- [Engage \(45–90 minutes\)](#)

Students are presented with a tulip’s process of asexual reproduction. Students begin to formulate ideas around the Can You Explain? (CYE) question.

- [Explore \(90 minutes\)](#)

Students investigate how organisms reproduce asexually, examining the cause-and-effect relationships between reproduction and genetic diversity of organisms, as well as differentiate between asexual and sexual reproduction.

- [Explain \(45–90 minutes\)](#)

Students construct scientific explanations to the CYE question by including evidence about asexual reproduction and its advantages and disadvantages.

- [Elaborate with STEM \(45–135 minutes\)](#)

Students apply their understanding of asexual reproduction as they investigate the reproductive capacity of microorganisms and connect the topics of asexual reproduction, genetic engineering, and the banana industry.

- [Evaluate \(45–90 minutes\)](#)

Students are evaluated on the state science standards, as well as Standards in ELA/Literacy and Standards in Math standards, using Board Builder and the provided concept summative assessments.

## **Integration of Career Readiness, Life Literacies and Key Skills**

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Students will work in small groups or partnerships to conduct investigations, build models or prototypes and present findings.

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|                  | Awareness of and appreciation for cultural differences is critical to avoid barriers to productive and positive interaction.  |
| TECH.9.4.8.CI.4  | Explore the role of creativity and innovation in career pathways and industries.  |
| WRK.9.2.8.CAP.15 | Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.<br><br>Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking. |
| WRK.9.2.8.CAP.10 | Evaluate how careers have evolved regionally, nationally, and globally.   |
| TECH.9.4.8.GCA.2 | Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.  |
| TECH.9.4.8.GCA   | Global and Cultural Awareness<br><br>Increases in the quantity of information available through electronic means have heightened the need to check sources for possible distortion, exaggeration, or misrepresentation.<br><br>Multiple solutions often exist to solve a problem.       |
| WRK.9.2.8.CAP.11 | Analyze potential career opportunities by considering different types of resources, including occupation databases, and state and national labor market statistics.   |
| TECH.9.4.8.IML.1 | Critically curate multiple resources to assess the credibility of sources when searching for information.   |
| TECH.9.4.8.GCA.1 | Model how to navigate cultural differences with sensitivity and respect (e.g., 1.5.8.C1a).  |
| WRK.9.2.8.CAP.1  | Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.   |

## **Technology and Design Integration**

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Technology is fully integrated using Discovery Techbook.

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| CS.6-8.8.1.8.DA.1 | Organize and transform data collected using computational tools to make it usable for a specific purpose.<br><br>People use digital devices and tools to automate the collection, use, and transformation of data. The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data. |
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## **Interdisciplinary Connections**

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| LA.SL.8.4 | Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.                |
| LA.RI.8.1 | Cite the textual evidence and make relevant connections that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.   |
| LA.W.8.1  | Write arguments to support claims with clear reasons and relevant evidence.   |
| LA.RI.8.4 | Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts. |

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| LA.W.8.7    | Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. |
| LA.RI.8.7   | Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.  |
| LA.W.8.2    | Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.   |
| LA.RI.8.8   | Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.                  |
| LA.RI.8.10  | By the end of the year read and comprehend literary nonfiction at grade level text-complexity or above, with scaffolding as needed.   |
| LA.SL.8.1   | Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly. |
| MA.6.SP.A.2 | Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.  |
| MA.6.SP.B.4 | Display numerical data in plots on a number line, including dot plots, histograms, and box plots.   |
| MA.6.SP.B.5 | Summarize numerical data sets in relation to their context, such as by:   |

## Differentiation

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### Struggling Students    ELL

- Using a two-column chart, ask students to compare and contrast sexual and asexual reproduction.

- Read the reading passage "[History of the Banana](#)" together as a class, stopping after key passages to check for understanding and clarify important information.

### Accelerated Students

- Challenge students to check for bacteria in a variety of locations, including: their hands, door handles, computer keyboards, sink faucet handles, calculators, cell phones, and under fingernails.
- Assign students to work in pairs to research how sexual and asexual reproduction results in an alternation of generations in plants such as mosses or ferns. Have them use [Board Builder](#) to create a Board with illustrations showing both the gametophyte and sporophyte form of the plant.

[Differentiation in science](#) can be accomplished in several ways. Once you have given a pre-test to students, you know what information has already been mastered and what they still need to work on. Next, you design activities, discussions, lectures, and so on to teach information to students. The best way is to have two or three groups of students divided by ability level.

While you are instructing one group, the other groups are working on activities to further their knowledge of the concepts. For example, while you are helping one group learn the planet names in order, another group is researching climate, size, and distance from the moon of each planet. Then the groups switch, and you instruct

the second group on another objective from the space unit. The first group practices writing the order of the planets and drawing a diagram of them.

Here are some ideas for the classroom when you are using differentiation in science:

- Create a tic-tac-toe board that lists different activities at different ability levels. When students aren't involved in direct instruction with you, they can work on activities from their tic-tac-toe board. These boards have nine squares, like a tic-tac-toe board; and each square lists an activity that corresponds with the science unit. For example, one solar system activity for advanced science students might be to create a power point presentation about eclipses. For beginning students, an activity might be to make a poster for one of the planets and include important data such as size, order from the sun, whether it has moons, and so on.
- Find websites on the current science unit that students can explore on their own.
- Allow students to work in small groups to create a project throughout the entire unit. For example, one group might create a solar system model to scale. Another group might write a play about the solar system. This is an activity these groups can work on while they are not working directly with you.

Differentiation in science gets students excited to learn because it challenges them to expand their knowledge and skills, instead of teaching the whole group concepts they have already mastered

## **Modifications & Accommodations**

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Refer to QSAC EXCEL SMALL SPED ACCOMMODATIONS spreadsheet in this discipline.

### **Modifications and Accommodations used in this unit:**

In addition to differentiated instruction, IEP's and 504 accommodations will be utilized.

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## **Benchmark Assessments**

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**Benchmark Assessments** are given periodically (e.g., at the end of every quarter or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

### **Schoolwide Benchmark assessments:**

Aimsweb benchmarks 3X a year

Linkit Benchmarks 3X a year

**Additional Benchmarks used in this unit:**

Pre and post assessments to measure growth.

**Formative Assessments**

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See assessments located in links above.

**Summative Assessments**

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**Summative assessments** evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

**Summative assessments for this unit:**

See assessments located in links above.

**Instructional Materials**

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See materials located in links above.

Discovery Techbook

Teacher made materials

Additional labs are available through NJCTL on-line curriculum

**Standards**

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| SCI.MS-LS1   | From Molecules to Organisms: Structures and Processes   |
| SCI.MS-LS3-2 | Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.   |
| SCI.MS-LS1-4 | Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.<br><br>Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction.<br><br>Genetic factors as well as local conditions affect the growth of the adult plant.<br><br>Animals engage in characteristic behaviors that increase the odds of reproduction. |
| SCI.MS.LS1.B | Growth and Development of Organisms<br><br>Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring.  |
| SCI.MS-LS1-5 | Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.   |
| SCI.MS-LS3   | Heredity: Inheritance and Variation of Traits   |