

# Answer Key with Questions

## Lesson Check: Types of Reproduction

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**1)** Asexual reproduction involves two parent organisms.

- True
- False

**2)** Hydra reproduce by \_\_\_\_.

- A) budding
- B) fission
- C) regeneration
- D) sexual reproduction

**3)** Sexual reproduction happens when the \_\_\_\_\_ material from two different sex cells combine.

## Answer Key with Questions

### Lesson Check: Types of Reproduction

---

4) In \_\_\_\_\_, an offspring grows from a piece of its parent.

- A) fission
- B) budding
- C) regeneration
- D) sexual reproduction

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---

**5)** What type of asexual reproduction occurs when a sea star is chopped up and thrown back into the ocean?

## Answer Key with Questions

### Lesson Check: Types of Reproduction

**6) What is vegetative reproduction?**

**7) In sexual reproduction, offspring inherit twice the DNA of each parent.**

- True
- False

## Answer Key with Questions

### Lesson Check: Types of Reproduction

---

**8) Which of the following is NOT a disadvantage of asexual reproduction?**

- A)** do not need a mate
- B)** little genetic variation
- C)** mutations can occur
- D)** all susceptible to same disease

## Answer Key with Questions

### Lesson Check: Types of Reproduction

---

**9)** Explain how organisms produced through sexual reproduction differ from those produced by asexual reproduction. Discuss what the advantages or disadvantages might be for each.

## Answer Key with Questions

### Lesson Check: Types of Reproduction

---

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### Lesson Check: Types of Reproduction

**10)** A specific form or variation of a gene is called an allele. In roses, one allele is called “everblooming” (e) because this allele causes plants to bloom at a younger age and for longer periods than plants found in the wild. Many modern rose breeds have two copies of the “everblooming” allele, while wild roses have two copies of the dominant “wild” allele (E).

a. How would you replace the numbers with the correct outcomes in the Punnett square below to show how two parent rose plants, each with one dominant allele and one recessive allele for blooming, can produce an offspring plant with the characteristics of the “everblooming” allele?

	E	e
E	1	3
e	2	4

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---

b. Compare the offspring from your Punnett square in part (a) to the offspring that result from taking a cutting from one parent rose plant, placing it in the soil, and allowing it to grow roots and produce flowers. Be sure to say what alleles the offspring will have and whether they are “everblooming” or “wild.”



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Answers may vary

## Extended-Response Rubric

	Level of Understanding	Evidence of Understanding
3	<b>Demonstrating Expected Understanding</b>	<p>Student response provides <b>clear</b> evidence of using the dimensions* to make sense of scientific phenomena and/or to design solutions to problems. Student is able to:</p> <ul style="list-style-type: none"> <li>▪ Explain how organisms produced through sexual reproduction differ from those produced by asexual reproduction;</li> <li><b>AND</b></li> <li>▪ Describe advantages AND disadvantages of each type of reproduction.</li> </ul>
2	<b>Progressing toward Understanding</b>	<p>Student response provides <b>partial</b> evidence of using the dimensions* to make sense of scientific phenomena and/or to design solutions to problems. The response lacks some critical information and details or contains some errors. Student is able to:</p> <ul style="list-style-type: none"> <li>▪ Explain how organisms produced through sexual reproduction differ from those produced by asexual reproduction <b>BUT</b> does not describe advantages AND disadvantages of each type of reproduction.;</li> <li><b>OR</b></li> <li>▪ describes advantages AND disadvantages of each type of reproduction <b>BUT</b> does not explain how organisms produced through sexual reproduction differ from those produced by asexual reproduction.</li> </ul>
1	<b>Beginning to Develop Understanding</b>	<p>Student response is incomplete or provides minimal evidence of using the dimensions* to make sense of scientific phenomena and/or to design solutions to problems.</p>
0	<b>Not Showing Understanding</b>	<p>Student does not respond or student response is inaccurate, irrelevant, or contains insufficient evidence of using the dimensions* to make sense of scientific phenomena and/or to design solutions to problems.</p>

\*As outlined in the Performance Expectations (PE) of the NGSS, the three dimensions are the disciplinary core ideas (DCI), science and engineering practices (SEP), and crosscutting concepts (CCC). Note that due to the complexity of the PEs, individual assessment items may not address all three dimensions.

### Scoring Notes:

Possible answers include:

Offspring produced through asexual reproduction do not have genetic variation, but offspring produced through sexual reproduction do have genetic variation. Advantages of sexual reproduction include having offspring with variations in traits. A disadvantage of sexual reproduction is that it takes time and energy to find a mate. An advantage of asexual reproduction is that a mate is not required. A disadvantage is the lack of genetic variation in offspring.

## Constructed-Response Rubric

<b>PE: MS-LS3-2:</b> 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.		
	<b>Level of Understanding</b>	<b>Evidence of Understanding</b>
3	<b>Demonstrating Expected Understanding</b>	<p>Student response provides <b>clear</b> evidence of using the dimensions* to make sense of scientific phenomena and/or to design solutions to problems. Student is able to:</p> <ul style="list-style-type: none"> <li>list the outcomes of a Punnett square that shows how two parent rose plants, each with one dominant allele and one recessive allele for blooming, can produce an offspring plant with the characteristics of the “everblooming” allele;  <b>AND</b></li> <li>compare the offspring from the Punnett square in part (a) to the offspring that result from growing a cutting from one of the parent rose plants;  <b>AND</b></li> <li>identify the alleles of the offspring that result from growing a cutting from one of the parents.</li> </ul>
2	<b>Progressing toward Understanding</b>	<p>Student response provides <b>partial</b> evidence of using the dimensions* to make sense of scientific phenomena and/or to design solutions to problems. The response lacks some critical information and details or contains some errors. Student is able to:</p> <ul style="list-style-type: none"> <li>list the outcomes of a Punnett square that shows how two parent rose plants, each with one dominant allele and one recessive allele for blooming, can produce an offspring plant with the characteristics of the “everblooming” allele <b>OR</b> compare the offspring from the Punnett square in part (a) to the offspring that result from growing a cutting from one of the parent rose plants <b>AND</b> identify the alleles of the offspring that result from growing a cutting from one of the parents;  <b>OR</b></li> <li>list the outcomes of a Punnett square that shows how two parent rose plants, each with one dominant allele and one recessive allele for blooming, can produce an offspring plant with the characteristics of the “everblooming” allele <b>AND</b> compare the offspring from the Punnett square in part (a) to the offspring that result from growing a cutting from one of the parent rose plants <b>AND</b> identify the alleles of the offspring that result from growing a cutting from one of the parents  <b>BUT</b> the Punnett square, the comparison and the identification of alleles contain minor errors or incomplete information.</li> </ul>
1	<b>Beginning to Develop Understanding</b>	<p>Student response is incomplete or provides minimal evidence of using the dimensions* to make sense of scientific phenomena and/or to design solutions to problems.</p>
0	<b>Not Showing Understanding</b>	<p>Student does not respond or student response is inaccurate, irrelevant, or contains insufficient evidence of using the dimensions* to make sense of scientific phenomena and/or to design solutions to problems.</p>

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**Scoring Notes:**

Possible answers include:

a. 1- EE, 2 - Ee, 3 - Ee, 4- ee

b. The offspring from the cross in part (a), which represents sexual reproduction, will either be "wild" (EE or Ee) or "everblooming" (ee). The rose plant grown from a cutting from one of the parent plants represents asexual reproduction and will have the same alleles as the parent (Ee). It will be "wild" because it has one dominant allele (E).