

Answers to 1.1 Checking Your Understanding Questions (Science Connections 9)

1) Describe three ways that you depend on the reproduction of cells.

- Body cells continually dying (e.g. skin cells) and need to be replaced
- Cellular reproduction was required to make the egg and sperm cells that made me, me.
- All food sources must reproduce so that we can harvest them sustainably in a way that does not threaten the species' continuity
- And more!

2) If all living things survived for only a single generation and did not reproduce, Earth would soon become a lifeless planet. Explain why.

Reproduction is essential for the continuation of life. All living things must eventually die. Reproduction, which can be thought of as the opposite of death, is what ensures that when living things die, they are 'replaced' or succeeded by other living things of the same kind (same species).

Thus, if living things did not reproduce, there would be nothing to succeed them when they died. Life would be replaced with non-life, leading to a lifeless planet.

3) How are the terms genetic material, DNA, and chromosome connected? What role do they play in reproduction?

DNA contains the genetic material, that is, the information required for living things to survive and grow. DNA is packaged into chromosomes → 46 in humans.

During reproduction, the correct amount of DNA must be passed on to the next generation, to ensure that the offspring have the complete set of instructions for life. Different forms of reproduction achieve this in different ways. In asexual reproduction (where the offspring are genetically identical to the parent), the parent copies its DNA and gives each offspring a complete copy of it. In sexual reproduction (where the offspring are a genetic combination of two parents' DNA), each parent provides half the number of chromosomes required for a fully functioning individual. (E.g. in humans, each parent provides 23 chromosomes in the sperm or egg cell, resulting in a human with 46 chromosomes.)

4) Compare sexual to asexual reproduction. Use a Venn diagram to show their similarities and differences.

Asexual	Same	Sexual
<ul style="list-style-type: none">- One parent- Offspring genetically identical to parent- (does not involve finding a mate)	<ul style="list-style-type: none">- Reproduction: one individual making 'copies' of itself (to ensure continuity of the species and	<ul style="list-style-type: none">- Two parents- Offspring not genetically identical to either parent

	sustainability of the ecosystem)	- (involves finding a mate)
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5) Read each description below. Decide if it is an example of asexual reproduction or sexual reproduction. Support your answer in each case.

a. *A bacterial cell divides to form two new independent bacterial cells.*

This is asexual reproduction. There is only one parent; the offspring are genetically identical to it.

b. *A female salmon lays thousands of eggs that will be fertilized by a male salmon.*

This is sexual reproduction, involving two parents. If the eggs are not fertilized, no baby salmon will hatch.

c. *A structure will form on the body wall of Hydra, shown below. This structure will grow to a miniature adult form that breaks away to be an independent organism.*

This is asexual reproduction. Only one parent is involved, and the offspring will eventually grow to be identical to the parent.

7) Is reproduction necessary for the survival of an individual? Is reproduction necessary for the survival of a species? Explain both of your answers.

Reproduction is not necessary for the survival of an individual. For example, there are many people who choose to be childless or are childless as a product of circumstance. This does not increase or decrease their survivability.

However, reproduction is absolutely essential for the survival of a species. Continuing the example from before, if all humans chose to be childless, then after the current generation, no more humans would exist and we would go extinct.

(Also, see answer to #2.)