**SEXUAL vs. ASEXUAL REPRODUCTION FACT SHEET**

Reproduction is the creation of a new individual or individuals from a previously existing organism or organisms. In animals, this can occur in two primary ways: sexual reproduction or asexual reproduction.

**SEXUAL REPRODUCTION**

In sexual reproduction, two individuals produce offspring that have genetic characteristics from both parents. Each of two parent organisms, male and female, contributes half of the offspring's genetic makeup. Sexual reproduction involves meiosis. Meiosis is a two-part cell division process in organisms that sexually reproduce which results in gametes (egg and sperm) with one half the number of chromosomes of the parent cell. Sexually reproducing organisms have two sets of genes for every trait (called alleles). Offspring inherit one allele for each trait from each parent, thereby ensuring that offspring have a combination of the parents' genes.

Mammals, fish, birds, amphibians and reptiles all use sexual reproduction. An easy rule of thumb is that larger animals tend to reproduce sexually. There are two types of sexual reproduction:

1. **External Fertilization** – This is usually done when eggs are laid in a wet environment. The eggs are then fertilized by the male outside of the female body. External fertilization typically results in the production of a large number of offspring many of which are killed before reaching adulthood. Amphibians and fish are examples of animals that reproduce in this fashion.

2. **Internal Fertilization** – In this type of reproduction, fertilization occurs within the female reproductive tract. Internal fertilization usually results in a smaller number of offspring which are cared for by the parents. Mammals, birds and reptiles reproduce in this fashion.

Sexual reproduction introduces new gene combinations into a population. New combinations allow for great diversity, because the offspring is different from the mother and father; it is a combination of both. This means that sexual reproduction produces a greater chance of variation within a species. This variation improves the chances that a species will adapt to its environment and survive.
Asexual Reproduction

In asexual reproduction only one parent is needed, resulting in offspring that are genetically identical to the parent (clones). Asexual reproduction involves one individual producing offspring that are genetically identical to itself. These offspring are produced by mitosis. Mitosis is cell division in which a complete set of chromosomes is passed on to the daughter cell.

Single celled and simple life forms tend to reproduce asexually. An easy rule of thumb could be that one celled and simple sea organisms reproduce asexually. Simple creatures such as amoebas, sponges, hydras and jellyfish all reproduce asexually.

The four main ways that asexual reproduction can take place are by binary fission, budding, fragmentation, and regeneration.

1. Binary fission - In which the cell divides creating two identical daughter cells.
2. Budding - In which an offspring grows out of the body of the parent.
3. Fragmentation - In this form, the body of the parent breaks into pieces, each of which can produce an offspring.
4. Regeneration - In this form, if a piece of a parent is detached, it can grow and develop into a completely new individual.

Asexual reproduction can be very advantageous to certain animals. Since all offspring are identical there are no bad combinations of traits. All offspring are perfectly adapted for their environment. Environments that are stable and experience very little change are the best places for organisms that reproduce asexually. The cloned offspring are more likely to succeed in the same stable areas as their parents. Asexual reproduction also works well for animals that remain in one particular place and are unable to look for mates. Because it does not require male and female participation, asexual reproduction occurs faster than sexual reproduction and requires less energy. Another advantage of asexual reproduction is that numerous offspring can be produced without "costing" the parent a great amount of energy or time.
**Sexual and Asexual Reproduction Questions**

1. What are the two basic ways that organisms reproduce?

2. Why do offspring produced by sexual reproduction show variation from their parents?

3. Explain meiosis.

4. What are two advantages of sexual reproduction?

5. What are two disadvantages of sexual reproduction?

6. Why do offspring produced by asexual reproduction show no variation from the parent?

7. Explain mitosis.

8. What are two advantages of asexual reproduction?

9. What are two disadvantages of asexual reproduction?

10. Complete the following statements:
    Sexual reproduction helps a species to be successful because …
    
    Asexual reproduction helps a species to be successful because…
Directions: For each picture decide whether that organism reproduces asexually or sexually. Place an A for asexual reproduction or an S for sexual reproduction next to each number in the box.

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<td>4. <strong>FLATWORM</strong></td>
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<td>5. <strong>AMOEBA</strong></td>
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<td>9. <strong>KANGAROO</strong></td>
<td>10. <strong>CORAL</strong></td>
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