

Name: _____

Section: _____

Date: _____

LAB 9: INVENTING LIFE FORMS

1 Instructions

The purpose of this lab is to create a life form that may have evolved on a planet other than Earth. Follow the instructions below detailing how to assign your alien's attributes!

1. Roll the die to simulate the role of chance in the evolution of your creature. Each role of the die represents the result of millions of years of successful chance variations in your alien's environment.
2. For each roll, match the number on the die to the corresponding adaptation listed below.
3. When you have finished, describe your creature (include a drawing, if you wish!). Give your alien's species a name and write a paragraph describing all the adaptations you've selected with the die. You should include information about the environment your creature needs to survive, where in our Universe your creature could exist, and what sort of food your creature might need. Is your creature alone in its environment? If not, how does it coexist with other species? How does it reproduce?

2 Adaptations

1. Skin:
If you roll a ... then your creature has...
 - (a) 1, 2, 3: scaly skin, like a snake
 - (b) 4, 5: mucus-covered soft skin, like a slug
 - (c) 6: leathery skin, like a cow
2. Openings:
People have different openings (or holes) in their bodies to breathe, get rid of waste, and eat. Some animals, like anemones, use one opening for several of these purposes. How many openings does your creature have, and what does it use them for?
If you roll a ... then your creature has ...
 - (a) 1, 2: one opening (like an anemone)
 - (b) 3, 4: two openings (like an earthworm)
 - (c) 5, 6: three openings (like a frog)
3. Body Shape:
If you roll a ... then your creature ...
 - (a) 1, 2, 3, 4: is longer than it is wide.
 - (b) 5, 6: has some other shape.
4. Segments:
If you roll a ... then your creature ...

- (a) 1, 2, 3: is divided into segments (like a centipede). Go to 5: “Appendages for Segments”
 - (b) 4, 5, 6: Has no segments (like a toad). Go to 6: “Appendages for No Segments”
5. Appendages for Segments:
- (a) Roll one die two times and add the numbers together to find the number of segments your creature has.
 - (b) Your creature has two appendages on each segment, so multiply by two to get the number of appendages. (For example: 3 segments times 2 = 6 appendages.) Go to 7: Skeleton.
6. Appendages for No Segments:
- (a) Roll one die; the number that appears is the number of segments your creature has. Go to 7: Skeleton.
7. Skeleton:
- If you roll a ... then your creature ...
- (a) 1, 2, 3: has an exoskeleton on the outside of its body (like a lobster). Go to 8: Exoskeleton
 - (b) 4, 5: has an endoskeleton on the inside of its body (bones, like you). Go to 9: Large Sizes.
 - (c) 6: has no skeleton. Your creature gets around by wiggling (like a worm). Go to 10: “Small Size”
8. Exoskeleton:
- If you roll a ... then your creature ...
- (a) 1, 2: has a hard shell (like a snail). Go to 10: Small Sizes.
 - (b) 3, 4: has a chitin-based, armor-like covering (like a beetle). It must shed this covering in order to grow. Go to 10: Small Sizes.
 - (c) 5, 6: has a protein-based, shell-like covering (like an insect). It doesn’t need to shed this covering to grow. Go to 9: Large Sizes.
9. Large Sizes:
- Roll one die for the range of your creature’s weight. If you roll a ... then your creature weighs between ...
- (a) 1: 6-9 lbs (like a cat)
 - (b) 2: 10-49 lbs (like a bobcat)
 - (c) 3: 50-99 lbs (like a German Shepherd)
 - (d) 4: 100-199 lbs (like an alligator)
 - (e) 5: 200-999 lbs (like a pig)
 - (f) 6: 1,000-100,000 lbs (like a dinosaur)
- Go to 11: Feeding the Cells of Large Animals.
10. Small Sizes:
- Roll one die for the range of your creature’s weight. If you roll a ... then your creature weighs between ...
- (a) 1, 2: 0-1 lbs (like a mouse)
 - (b) 3, 4: 1-2 lbs (like a rat)
 - (c) 5, 6: 2-5 lbs (like a chicken)

Go to 12: Feeding the Cells of Small Animals.

11. Feeding the Cells of Large Animals:

We take in air and food from our environment. Our blood absorbs oxygen from the air and nutrients from food. Our hearts pump the blood through our bodies, carrying the oxygen and nutrients to every cell. Roll one die to find out how your creature gets oxygen and nutrients to its organs. If you roll a ... then your creature ...

- (a) 1, 2, 3, 4: has one heart to pump blood
- (b) 5, 6: has multiple hearts (like an octopus). Roll one die for the number of hearts.

Go to 13: Moving Around.

12. Feeding the Cells of Small Animals:

Like people, earthworms take in oxygen and food from their environment. The oxygen and food nutrients are absorbed in the worm's blood. Five small hearts pump blood through the body to give oxygen and nutrients to all the cells. Other small animals get food and oxygen to their cells in different ways. Roll one die to find out how your small creature gets oxygen and nutrients to its cells. If you roll a ... then your creature ...

- (a) 1, 2: has oxygen and food in the blood, and only one heart (like a mouse)
- (b) 3, 4: has oxygen and food in the blood, and multiple hearts (like an earthworm). Roll one die for the number of hearts.
- (c) 5: has oxygen and food in the blood, which sloshes around inside, bathing all cells (like a lobster)
- (d) 6: is only a few cells thick. It absorbs oxygen and food directly through its skin, and has no blood (like a flatworm)

13. Moving Around:

If you roll a ... then your creature ...

- (a) 1: crawls on land (like a snail)
- (b) 2: walks on land (like a centipede, beetle, lizard, or ostrich)
- (c) 3: swims in water (like a fish)
- (d) 4: drifts in water (like a jellyfish)
- (e) 5: has jet propulsion in water (like a squid)
- (f) 6: flies in the atmosphere (Like a bird or a bat). If your creature is larger than 100 lbs, roll again.

14. Sensing Vibrations:

People use their ears and sense of touch to feel vibrations in the air and the ground. What does your creature use to sense vibrations? If you roll a ... then your creature ...

- (a) 1, 2, 3: has organs, like ears, to sense vibrations in the air (like a mole) or in the water (like a dolphin).
- (b) 4, 5, 6: has small hairs scattered over its body to sense vibrations in the air or water (like some fish or spiders)

15. Chemical Sense:

People have sensors that detect chemicals in the air, food, or water. They are in your nose and tongue, but chemical sensors are not always in noses or tongues. Spiders have them on the soles of their feet. Where are your creature's sensors located? If you roll a ... then your creature's sensors are located ...

- (a) 1, 2, 3: in one place (like a spider)

- (b) 4, 5, 6: in two places (like humans)
16. Number of Eyes:
If you roll a ... then your creature ...
- (a) 1, 2: has no eyes (like a blind cavefish)
 - (b) 3, 4: has two eyes
 - (c) 5, 6: has more than two eyes (like a spider)
17. Eating:
If you roll a ... then your creature ...
- (a) 1, 2, 3, 4: is an herbivore (like a cow). Needs something with which to snip and grind plant parts. Go to 18: Herbivores.
 - (b) 5: is a carnivore (like a tiger). Needs to have parts that tear meat, like claws and sharp teeth. Go to 19: Predator.
 - (c) 6: is both an omnivore (like a bear). Needs to have the ability to both grind and tear. Go to 19: Predator.
18. Herbivores
Your creature must protect itself against predators. Go to 20: Protection-Defensive. Structures.
19. Predator:
How does your creature catch its prey? Roll your die twice and add the numbers to get one adaptation. Repeat to get a second adaptation. If you roll a ... then your creature ...
- (a) 2: chases prey (like a cheetah)
 - (b) 3: hits prey (like a hawk)
 - (c) 4: suffocates prey (like a python)
 - (d) 5: blinds prey (like a spitting cobra)
 - (e) 6: spears prey (like a harpoon worm)
 - (f) 7: injects poison (like a scorpion)
 - (g) 8: makes a trap (like a spider)
 - (h) 9: lures prey with a treat (like an anglerfish)
 - (i) 10: shocks its prey (like an electric eel)
 - (j) 11: stuns its prey with vibrations (like a dolphin)
 - (k) 12: works together with others of the same species (like wolves)
20. Protection - Defensive Structures:
If you roll a ... then your creature ...
- (a) 1, 2: has spines (like a porcupine)
 - (b) 3, 4: has a thick, protective covering (like a turtle)
 - (c) 5, 6: has horns (like a rhino)
21. Protection - Poison as Defense:
If you roll a ... then your creature ...
- (a) 1, 2, 3, 4, 5: is not poisonous. It has camouflaged coloring so it blends in with the plants most common plant color (like a grasshopper).

- (b) 6: is poisonous to eat, or has a venomous sting. It has coloring that warns other animals to leave it alone by standing out against the plant color (like a poison arrow frog).
22. Protection - Defensive Behaviors:
If you roll a ... then your creature ...
- (a) 1: runs away (like an antelope)
 - (b) 2: hides (like a prairie dog)
 - (c) 3: freezes; stands still (like a pheasant)
 - (d) 4: fights (like a cat or a dog)
 - (e) 5: pretends its bigger than it really is (like certain kinds of fish)
 - (f) 6: works together with other of its species (like a musk ox)
23. Reproduction:
If you roll a ... then your creature ...
- (a) 1, 2, 3: is asexual. Your creature reproduces by budding off a piece of itself, which grows into another organism (like a sea anemone). Go to 26.
 - (b) 4, 5, 6: is sexual. Your creature reproduces through sex. Two or more organisms share their adaptations, and produce offspring slightly different from themselves.
24. Genders:
If you roll a ... then your creature ...
- (a) 1, 2: has two genders, A and B. Every individual has only one gender (like mammals).
 - (b) 3, 4: has two genders, A and B. Every individual has both genders, but two individuals are required to mate (like earthworms).
 - (c) 5, 6: has three genders, A, B, and C. Every individual has one gender, and three individuals are required to mate (no examples on Earth).
25. Mating:
What are your alien's mating rituals? If you roll a ... then your creature uses ...
- (a) 1, 2: a mating call (like many birds)
 - (b) 3, 4: bright colors (like a male pheasant)
 - (c) 5: mating dance (like a male peacock)
 - (d) 6: mating smell (like big moths)
26. Offspring:
If you roll a ... then your creature ...
- (a) 1: lays many eggs, which develop independent of their parents' care.
 - (b) 2, 3: lays a few eggs, and takes care of eggs and young (like birds)
 - (c) 4, 5: give live birth, and care for the young in some sort of nest (like rabbits)
 - (d) 6: gives live birth, and cares for young in a pouch (like kangaroos)

Your creature is finished! Describe it below according to the instructions on the first page. You may also draw a small picture if you wish.