

Environmental Changes Resilience Dice Game

Estimated Time: 30-40 minutes

Age range: 3rd grade

What you need: Paper, pencil, colored pencils (optional), 2 dice (if you do not have dice, you can use a “dice app” online!)

Background Information:

A **habitat** is a natural home for living things that has everything an organism needs to survive. The four parts of every habitat are: **food, water, shelter, and space.**

Habitats for different organisms can overlap because different organisms can use the same food, water, shelter, or space as part of their habitat.

New Words

Habitat- a natural home for living things that has everything an organism needs to survive.

Environmental Change- changes to an organism's habitat or ecosystem.

Resilience- How an organism recovers after experiencing an environmental change.

Contaminants- harmful chemicals, poisons or pollutions that make a substance impure or hazardous.

Adapt/adaptation- to modify, change, become better suited for new conditions; a change in the structure and or function of an organism that helps the organism become better fitted to its environment.

Imagine you are a coyote.

Draw yourself as a coyote in its habitat. Include the 4 key parts of a habitat! (food, shelter, water, space).

Environmental Changes: These include 3 major types of change

1. Changes to how the land looks
2. Changes in temperature
3. Changes in availability of food

Resilience: As animals respond to the changes in their **habitat**, some will move to a new place, some will survive and be able to have offspring, and some will die. We call these the levels of resilience.

Levels of Resilience:

1. Move to a new location
2. Survive and reproduce
3. Die



Environmental Change and Resilience

Give an example of each type of environmental change that could affect your animal. If you were a coyote, how do you think you would respond to these changes? Write one possible response down for each type of change!

Changes to how the land looks: _____

Changes in temperature: _____

Changes in amount of food and water you have: _____

Let's Play!

In this game, you will be a coyote trying to hunt for prey (food) in the scrublands of Carson Valley! In this type of habitat, a coyote would typically eat quail and rabbit. In our game, you will be trying to survive by catching enough prey(food) each round.

Round 1: No Environmental Change

1. Roll 2 dice to start hunting for food (for younger students, play with one die, for older, play with both). In this game, your habitat has a lot of rabbit and quail. Coyotes are not picky and will eat whichever of these they catch. If you roll an *odd* (1,3,5) number, you catch a rabbit. If you roll an *even* (2, 4, 6) number, you catch a quail! Rabbits are worth 5 points. Quail are worth 2 points. You need at least 18 points to survive this round.
2. You can use a bar graph, tallies, or addition to keep track of how much prey you catch as the game goes on! You should keep track of the number of rabbit and quail separately so you can compare the numbers later.
3. Play 6 rounds (roll the dice 6 times). Be sure to keep track of your prey!

Round 2: Pollution appears!

Oh no! A large factory has opened down by the river in your habitat, where you usually go to drink and stalk rabbits in the nearby marshlands. Sadly, the factory has not been monitoring its pollution. It has begun to leak **contaminants** into the water. Rabbits drink from this stream and have now become sick from exposure to the pollutants. One of your food sources is now threatened. What type of environmental change is this?



1. Roll 2 dice to begin hunting again. In this round, you only catch a rabbit if you roll a 3. If you roll any other number, you catch a quail. Rabbits are worth 5 points, quail are worth 2 points. You need 25 points to survive this round.

2. You can use a bar graph, tallies, or addition to keep track of how much prey you catch as the game goes on! You should keep track of the number of rabbit and quail separately so you can compare the numbers later. To save paper use the same graph from round 1 but use a different color this time!
3. Go for 6 rounds (roll the dice 6 times). Be sure to keep track of your prey!

Did you survive this round? Why would this environmental change make it harder or easier to survive?

Round 3: Fire!

It has been an incredibly dry year in the Eastern Sierras. Between low snowpack, and lots of dry brush and trees, the fire danger has climbed higher and higher as the summer months get hotter. One day, a controlled burn gets out of hand and sparks jump to a nearby forest grove. Before you know it, your home has caught on fire! You must now **adapt** in order to survive this new threat. What type of environmental change is this? You have two options this round; you can stay or move.



STAY: You decide to stay in your current habitat and attempt to hunt. However, due to the fire, quail have left this habitat. To adapt, you have begun to eat snakes instead. Remember, coyote are not picky! You survive and move on to a new habitat if you catch enough prey!

1. Roll 2 dice to begin hunting again. If you roll a 3, you catch a rabbit. If you roll any other numbers, you catch a snake. Rabbits are worth **3 points**, quail are **worth 1**. You must get at least **30 points** to survive.
2. You can use a bar graph, tallies, or addition to keep track of how much prey you catch as the game goes on! You should keep track of the number of rabbit and quail separately so you can compare the numbers later. To save paper use the same graph from round 1 but use a different color this time!
3. Go for 4 rounds (roll the dice 4 times). Be sure to keep track of your prey!

MOVE: You decide to move further downstream to a new habitat and find out what prey might live there.

1. You are happy to discover your new habitat seems to have plenty of prey available and does not seem to have been affected by the fire. Roll 2 dice to begin hunting again. If you roll a 3, you catch a rabbit. If you roll any other numbers, you catch a quail. Rabbits are worth 5 points, quail are worth 2.
2. You must get at least **15 points** to survive this round.

2. You can use a bar graph, tallies, or addition to keep track of how much prey you catch as the game goes on! You should keep track of the number of rabbit and quail separately so you can compare the numbers later. To save paper use the same graph from round 1 but use a different color this time!
3. Go for 4 rounds (roll the dice 4 times). Be sure to keep track of your prey!

Did you survive this round? Why would this environmental change make it harder or easier to survive?

Sources:

<https://cdn.recordcourier.com/wp-content/uploads/sites/6/2016/09/coyote-RCR-091315.jpg>

<https://www.nrdc.org/stories/water-pollution-everything-you-need-know>