



Doing the Activity

Limiting Factors: How Many Bears?

Activity Overview:

Guide: Adapted from *Project WILD K-12 Curriculum & Activity Guide* (4th edition)

Suggested Grade: Upper Elementary, Middle School

Setting: Indoors

Theme: Habitat, Carrying Capacity, Populations

Subject Areas: Environmental Education, Science, Math

Adaptation Time: 45 minutes

Recommendations for Using this Activity:

- *Online Project WILD Professional Development for Educators:* Conduct synchronously using an online meeting platform.
- *Online Instruction for Students:* Conduct synchronously *OR* conduct both synchronously and independently--This simulation (the How Many Bears Game) can first be conducted with the whole group and then students can work independently or in small groups to complete the follow-up discussion questions in step four of the “Conducting the Activity” section. See below.

Getting Ready:

Technology tools, set up and tutorials:

- Make a copy of the [Flippity How Many Bears Game](#) Google Sheet, rename and save it in a Google Drive location. A brief tutorial on how to save Google files may be found [here](#). Open the copy of the How Many Bears Game Google Sheet and navigate to the file menu, and within the file menu, to the “Publish to the web” and click. When prompted, click the “Publish” key. Click on the fifth tab at the bottom of this Google Sheet titled “Get Link Here.” When that tab is clicked, at the top of the sheet is the link you will need to copy and give to your students so they can access the Flippity game board to play the game. NOTE: You may adjust the landing space instructions, as well as the cards to customize your game, but it is not necessary to change anything.
- Make a copy of the Google doc titled [How Many Bears Game Instructions](#), and set the sharing so that anyone with the link can view. The link to your *Flippity How Many Bears Game* Google Sheet will need to be copied using the Share button at the top of the page. The link to the “Instructions . . .” Google doc will need to be shared with all the participants. On page 2 of the

instructions, divide the participants into groups--ideally four--but vary as needed for the number of participants and fill in the names of the participants for each group in advance.

- Make a copy of the [How Many Bears Game Recording Sheet](#) for the teams of participants to record the food they find. The sharing for this link needs to be “Anyone with the link can edit” and the link to this Google sheet needs to be copied and pasted into the [How Many Bears Game Instructions](#) in direction #1.

Participant Materials: Students will need the link to the *How Many Bears Game Instructions* with the appropriate links from the facilitator in the document.

Conducting the Activity:

1. Introduction (estimated 5 minutes): Provide participants with the following instructions: "You are now black bears and in order to survive, you'll be shortly heading out to search for food. All bears are not alike, just as you and I are not exactly alike. Among you there may be a young male bear who has not yet found his own territory and met up with a larger male bear in the big bear's territory, and before he could get away, he was hurt. He has a broken leg. There may also be a young female bear among us who investigated a porcupine too closely and was blinded by the quills. Finally, one of you may be a mother bear with two fairly small cubs who must gather twice as much food as the other bears. To search for food, in a few moments I will send you to a forest, but before I do, what sorts of foods might you be searching for?"

Answers might include:

Nuts (acorns, pecans, walnuts, hickory nuts)

Berries and fruit (blackberries, elderberries, raspberries, wild cherries)

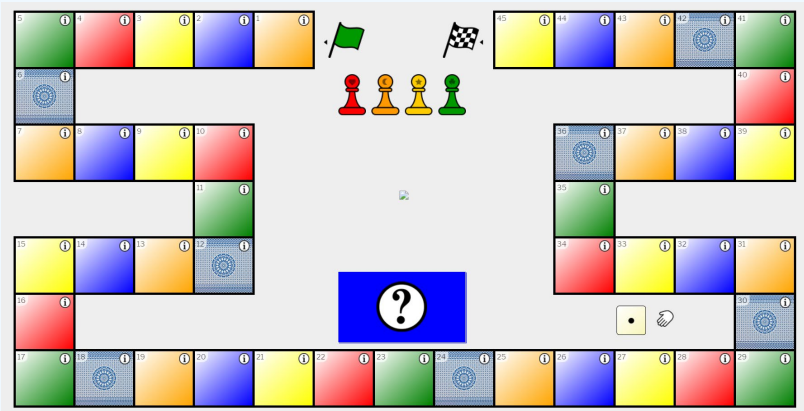
Insects (grub worms, larvae, ants, termites)

Meat (mice, rodents, peccaries, beaver, muskrats, young deer)

Plants (leaves, grasses, herbs)

2. How Many Bears Game (estimated 30 minutes): Introduce participants to their “forest” which will be the *How Many Bears Flippity Game* by sharing the game board on your screen.

Explain to participants that this game board is their forest and they will soon be sent to breakout rooms with 4 people in a group to go out and forage for their food as black bears. Using the chat box in your meeting platform, provide each group with a link to the *How Many Bears Game Instructions*. Demonstrate how to roll the die, move the player pieces and find out the small “i” in the circle to find out what food they’ve found. Also, point out that if they land on a space and it says “Draw A Card”



they will click on the blue card with the question mark to see what they're getting. Demonstrate how to record their food in the How Many Bears Recording Sheet.

3. Playing the How Many Bears Game (estimated 20 minutes): Divide the participants into their preassigned groups and list group members on page 2 of the *How Many Bears Game Instructions*. Then put each group into a breakout room in your online meeting platform. Monitor

the groups by popping in to see if there are any questions and to determine how much time needs to be allotted for teams to all finish up. When all the teams have finished, return everyone to the main group. Share the *How Many Bears Game Recording Sheet* and use this to debrief the activity.

Ask if anyone received the card that made them the blind bear. Navigate to the participants data and ask how much food he/ she acquired. Write the word "blind" below the total amount of food and highlight it. Repeat this process for any injured bears and the mother bears, asking how much they acquired and record "injured" or "mother" under their totals and highlight it. Explore how much food each bear found by exploring the sheets with the participants. Tell participants each bear needs 80 pounds to survive. Which bears survived? Is there enough to feed all the bears? How many pounds did the blind bear(s) collect? Will s/he survive? What about the mother bear(s)? Did she get twice the amount needed to survive? What do you think will happen to her cubs? Do you think she will feed her cubs first or herself? Why? What would happen to her if she fed the cubs? What if she ate first? If the cubs die, can she have more cubs in future years? (The mother bear will eat first and the cubs will get whatever, if any, is left. The mother must survive; she is the hope for a continued bear population. She can have more cubs in her life; only one needs to survive for the population to remain static.)

Each participant should have picked up at least one square representing a water source or that bear will not survive. Water can be a limiting factor and is an essential factor of habitat.

Ask participants to record how many pounds of each of the five categories of food they gathered. Next, ask each participant to convert those numbers into percentages of the total poundage of food each gathered.

Share the following and ask participants to compare their percentages with the typical percentages eaten by black bears in Arizona.

- Nuts-20 pounds (25%)
- Berries and fruit-20 pounds (25%)
- Insects-12 pounds (15%)
- Meat-8 pounds (10%)
- Plants-20 pounds (25%)
- TOTAL NEEDED TO SURVIVE FOR 10 DAYS-80 pounds (100%)

Ask participants to discuss how healthy their bears would be given their diet. How do the bears' requirements for a diet seem to compare with the needs of humans for a balanced and nutritious diet?

4. Wrapping Up: (estimated 10 minutes) Ask participants to determine the amount of food in each category to support all of the bears in this activity. Did we have sufficient food to support all our black bears? If sufficient food were available for all of the bears, would the population likely increase the following year? Have participants support their answers. Other than food, what factors, natural or human-related, might also limit the growth of the bear population? How would each of these factors affect the bear population? Could the bear population increase indefinitely if unlimited food were available? Why or why not?

Getting Outdoors

Encourage students to go out into their yard, local park or natural area, or school yard and observe what local wildlife species are present. Research what food sources are needed by one of the species. Describe or map where that food source is present at the site. What changes to the site could happen over the next five years that would increase food for this species at this site? What changes might reduce the food source?

Keep safely in mind and follow guidelines for #ResponsibleRecreation. See <https://www.fishwildlife.org/responsible-recreation>.

Assessment: Provide a link to your *Flippity How Many Bears Game* to participants which allows them to view only and have them make a copy. Have participants research the food needs of a different species, ideally a species native to where they live, and design their own "How Many" Flippity Game based on the needs of the species.

Additional Options:

Virtual Field Trip: Engage a local outreach or education staff member of a wildlife area or nature center to provide a virtual field trip or presentation to help students learn about native and non-native species in your area.