

ALIENS IN SOUTH DAKOTA: Aquatic Invasive Species

Bodies of water in South Dakota have been invaded by aliens. No, not the aliens you have seen in the movies. These aliens are called aquatic invasive species and they are aliens because they are from other parts of the country or world. These species have found their way to South Dakota and could be changing the ecosystem they have invaded. It is your job to find out how these invaders affect their new surroundings, how they got there, and what people can do to help the situation.

Each day you will have an opportunity to collect information. At the end, you will create a way to inform people about aquatic invasive species.

DAY 1: Ecosystems

What is an ecosystem?

Read the following article(introduction and three roles) and answer the questions below.

<https://kids.britannica.com/kids/article/ecosystem/433377>

What are the two main parts of an ecosystem?

What is a producer?

What is a consumer?

What is a decomposer?

Make a chart, go outside and keep track of the producers, consumers and decomposers you see outside. Try to find at least 3 of each. You can write about them and sketch them if you choose.

Hints: Producers are easy to find; consumers can be a little more challenging. Try to quietly sit in a spot for a few minutes, watch closely for consumers. Sometimes when we are quiet and patient, we will be able to see more wildlife. Decomposers can be found under rocks or logs. Search under these items but be careful and put the rock or log back the way you found it so you do not destroy the decomposer habitat.

Producers	Consumers	Decomposers



DAY 2: Food Web and Energy

What are some interconnections of an ecosystem?

Read the article (feeding levels, energy flow, recycling nutrients).

<https://kids.britannica.com/kids/article/ecosystem/433377>

Then, watch the following videos:

<https://www.youtube.com/watch?v=0ZOvgYypOuo&list=PL7BdKM5Q4pMc6He4GBwToCi9iQUxKLSvO&index=4>

<https://ed.ted.com/lessons/dead-stuff-the-secret-ingredient-in-our-food-chain-john-c-moore>

Create a food chain or food web from the producers, consumers, and decomposers you observed outside. For an example look at the diagram from Britannica:

<https://kids.britannica.com/kids/article/ecosystem/433377>

<https://www.cserc.org/sierra-fun/games/build-food-chain/>

DAY 3: Biodiversity

How does biodiversity measure the health of an ecosystem?

Watch the following video:

<https://www.youtube.com/watch?v=iR2AyybowPc>

Read the following article:

<https://kids.nationalgeographic.com/explore/science/declining-biodiversity/>

In your own words, what is biodiversity and why is it important to an ecosystem?

DAY 4: Aquatic Habitats and Biodiversity

What does biodiversity look like in an aquatic habitat?

Today we are going to measure the biodiversity of a body of water.

*You will need a small minnow net preferably one that has been cleaned or hasn't been used before (if you don't have one, that's ok too) and some type of small cup to keep collected organisms. With a responsible adult, find a stream (that is not flowing too quickly) or pond. Bring a notebook to keep track of your work.



1. Sketch the aquatic habitat in your journal. What do you notice about the landscape around the water? How fast is the water flowing? Do you notice and wildlife on the surface of the water? Can you see the bottom of the body of water? Put all of this in your journal.
2. Next, collect some samples of the aquatic macro invertebrates in the water. You will need a bit of water in your collection cup to keep the invertebrates alive. If you have a net, a great way to catch is to sweep your net through the grass or other vegetation at the edge of the pond or stream. Then, investigate your net and look for any small critters moving around. Sometimes these will be very small and sometimes they will be easily seen. Pick up the critters and put them into your collection cup. Another way to find critters is to look under rocks.
3. After you have collected, begin to count the variety of organisms (living things). Keep track in a chart or some other organized way in your notebook.
4. Pick one organism that you are interested in. In your journal, sketch that organism. Does it have legs? How many? What does its body look like? Add label and write about how it moves.
5. You don't have to know what the organism is, but you can use the identification key below if you would like to identify it. You can do this with as many of the organisms as you like.
6. How does the health of this ecosystem look to you? Think about all the pieces you explored. Be ready to share you findings with others.

CHECK OUT THESE RESOURCES BEFORE YOU GO!

Identification key

<https://extension.usu.edu/waterquality/macrokey/>

What are aquatic macro invertebrates

<https://extension.usu.edu/waterquality/learnaboutsurfacewater/propertiesofwater/aquaticmacros>

Freshwater Habitats

<https://kids.nationalgeographic.com/explore/nature/habitats/freshwater/>

DAY 5: Aquatic Invasive Species

What are aquatic invasive species?

Yesterday you checked out the health of a stream or pond. What would happen to the aquatic habitat if an invader moved into the area?

What the videos below:

<https://www.youtube.com/watch?v=gYNAtw1c7hI&t=29s> National Geographic Invasive Species

https://www.youtube.com/watch?v=spTWwqVP_2s TED ED invasive species

https://www.oregonlive.com/environment/2012/08/invasive_species_could_be_tran.html article about invasive species release from classroom



How would you describe an invasive species?

What are some of the consequences of invasive species moving into a new area?

Are all non-native species invasive?

What can people do to help reduce the spread of invasive species?

Project: Choose one of the aquatic invasive species found in South Dakota.

<https://sdleastwanted.sd.gov/species/default.aspx>

Find out how this species is interfering with the ecosystem in South Dakota and what can be done to help stop the invasive species spread.

Create a short public service announcement or flyer to help people understand the negative affects of the species you chose and what they can do about it. You may create a video, radio announcement, newspaper article, comic book story, or flyer.

Resources for research:

<http://neinvasives.com/documents/Invasive-Species-Cards.pdf>

<https://sdleastwanted.sd.gov/species/default.aspx>

<https://www.youtube.com/watch?v=ablmgGDzXBo> Zebra Mussels

https://www.youtube.com/watch?v=Hkqw8dF_fWU Rusty Crayfish

<https://www.youtube.com/watch?v=rPeg1tbBt0A> Asian Carp

5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations

MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

