Designing Solutions to Solve Problems

Grade 3 Science


LET'S PLAY
A GAME!

Saving the Salamanders

Grade 3 Science

What animal am I?

- I usually have a tail.

What animal am I?

- I usually have a tail.
- I have legs.

What animal am I?

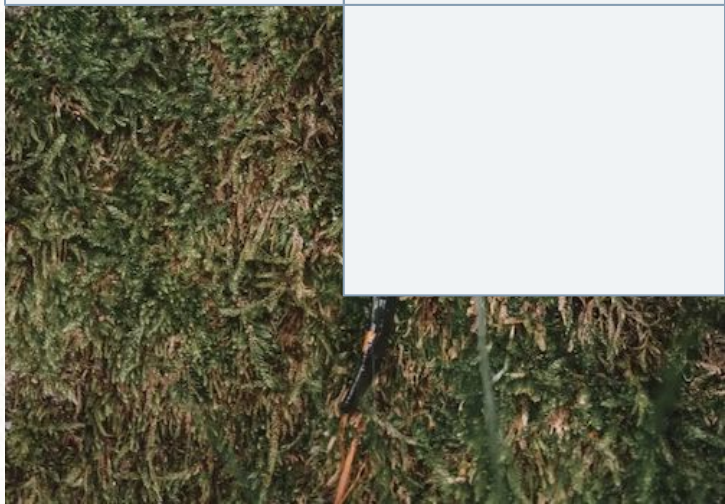
- I usually have a tail.
- I have legs.
- Some of us play on land. Others play in water.

What animal am I?

- I usually have a tail.
- I have legs.
- Some of us play on land. Others play in water.
- My skin is moist.

What animal am I?

- I usually have a tail.
- I have legs.
- Some of us play on land. Others play in water.
- My skin is moist.
- I lay eggs.



What animal am I?

- I usually have a tail.
- I have legs.
- Some of us play on land. Others play in water.
- My skin is moist.
- I lay eggs.
- Some can regrow a lost limb or tail.

What animal am I?

- I usually have a tail.
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- Some can regrow a lost limb or tail.
- Some have gills. Others develop lungs.

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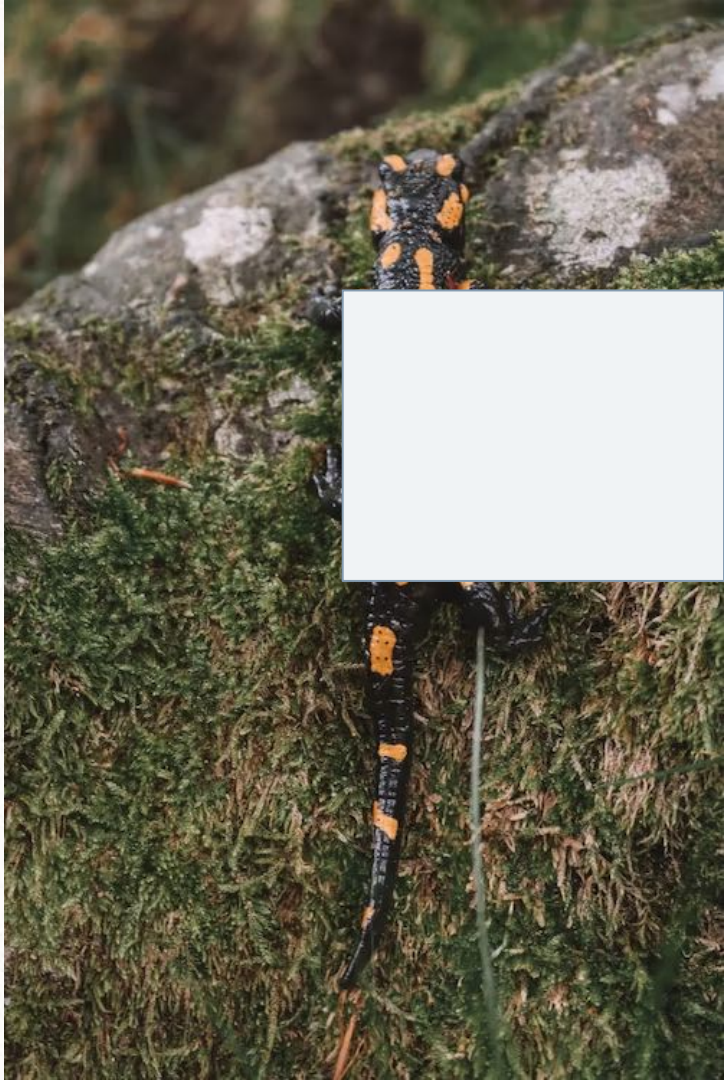
- Some are toxic and show this with bright colors.



What animal am I?

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- I have legs.
- Some of us play on land. Others play in water.
- My skin is moist.
- I lay eggs.
- Some can regrow a lost limb or tail.
- Some have gills. Others develop lungs.
- Some are toxic and show this with bright colors.
- I am an amphibian but not a frog or toad.

I am a salamander

Saving the Salamanders

Grade 3 Science

ACTIVITY 1

Did you know?

What do you know now?

Turn and tell a classmate 2 things you learned about salamanders from this video.

1. Tennessee is the salamander capital of the world.
2. 56 different salamander species in TN.
3. Eastern Hellbender is largest salamander in TN and North America.
4. Salamanders need clean, fresh water.
5. Salamanders are an indicator of water quality.
6. Estern Hellbender is an endangered species.

Focus Question

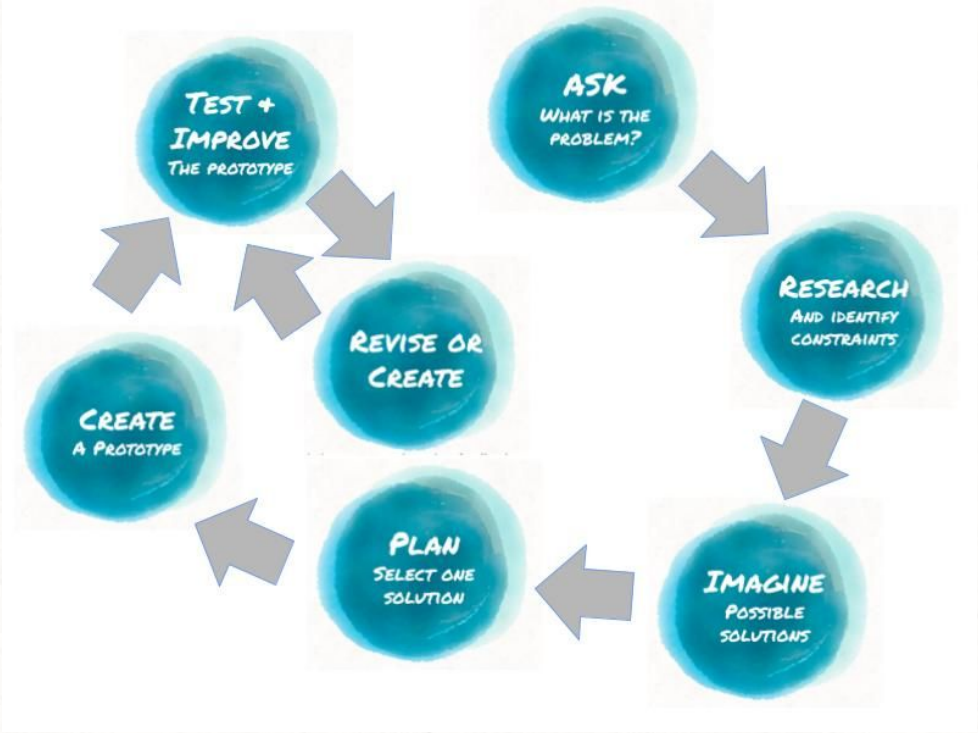
How have humans impacted salamander populations?

- Human development has reduced and disrupted salamander habitats.
- Humans have polluted bodies of water that salamanders use to lay eggs.
- Salamanders are killed while trying to cross roadways.
- Foreign fungus may infect salamanders in North America.

ACTIVITY 2

How can we, as TVA wildlife conservationists, design a solution to solve a problem affecting salamander populations?

Engineering Design Process



What is our process for designing a solution?

Engineering Design Process

What is the negative outcome that we want to prevent?

What or who is causing the problem?

What (or who) is the problem?

- Humans are building roads that separate salamanders from bodies of water needed to lay eggs.
- Humans are building homes and businesses and destroying salamander habitats.
- Humans are polluting bodies of water with trash, sediment caused by erosion, and chemicals from littering and fertilizers used in agriculture.

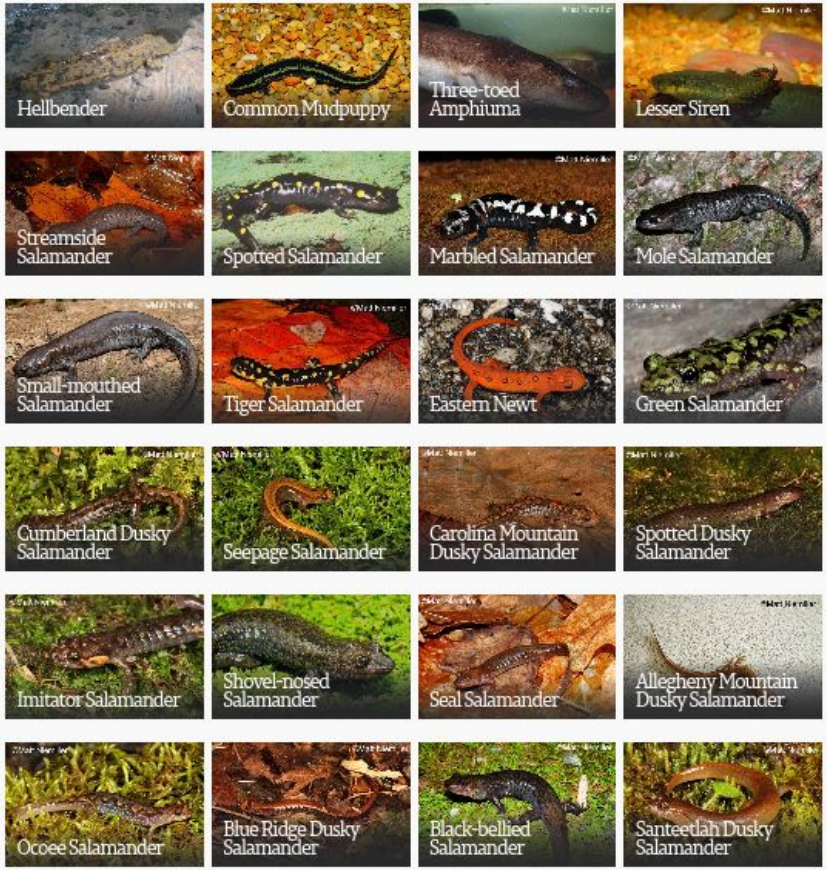
Humans are the biggest threat to salamander survival.

Engineering Design Process

What do I need to know about salamanders?

What will affect my design?

Research Resource



Salamanders in Tennessee

https://www.tn.gov/twra/wildlife/amphibians/salamanders.html

Engineering Design Process

Brainstorm as many possible solutions before deciding on one.

Don’t limit your ideas here.

All Ideas are welcome

Improve an existing solution

Think of a new idea

Be inspired by the items around you

Be creative

Don’t worry if it will work yet

Don’t stop dreaming

Use an idea to think of another idea

Look for clues in the problem

Engineering Design Process

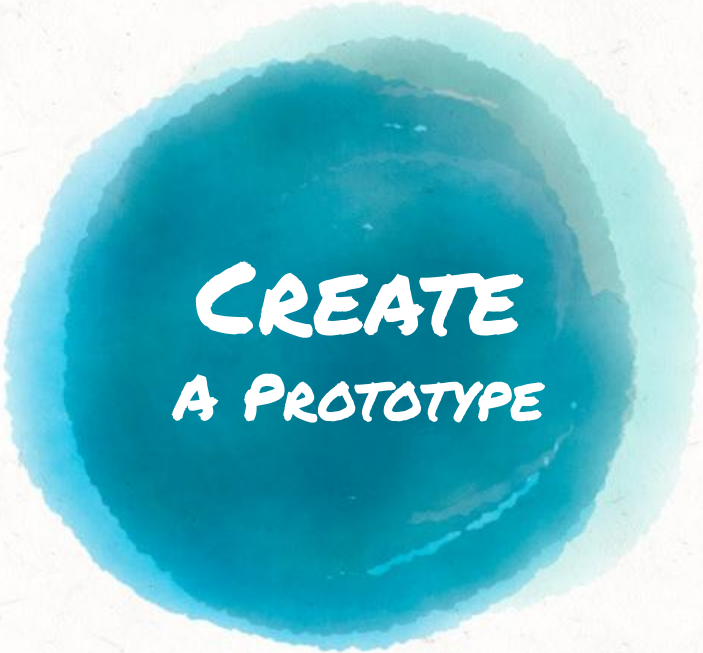
Select the most promising solution to the problem.

Develop a plan and/or sketch a design.

2 minutes to choose

60 second sketch

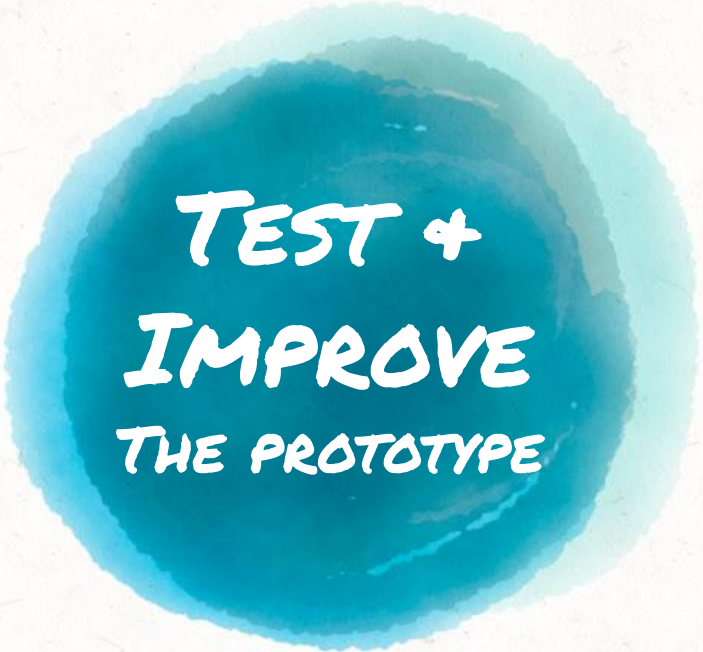
Engineering Design Process



Construct a physical or digital prototype of your solution.

Prototype work session

Engineering Design Process



Try out your solution. Get feedback from others.

How can it be improved? What worked well?

Show + Share

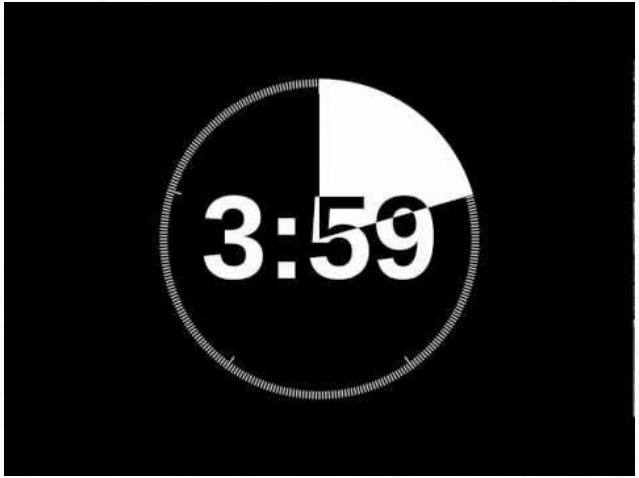
Partner A

1. Show your prototype.
2. Share how it solves the problem.
3. Get feedback from your classmate.

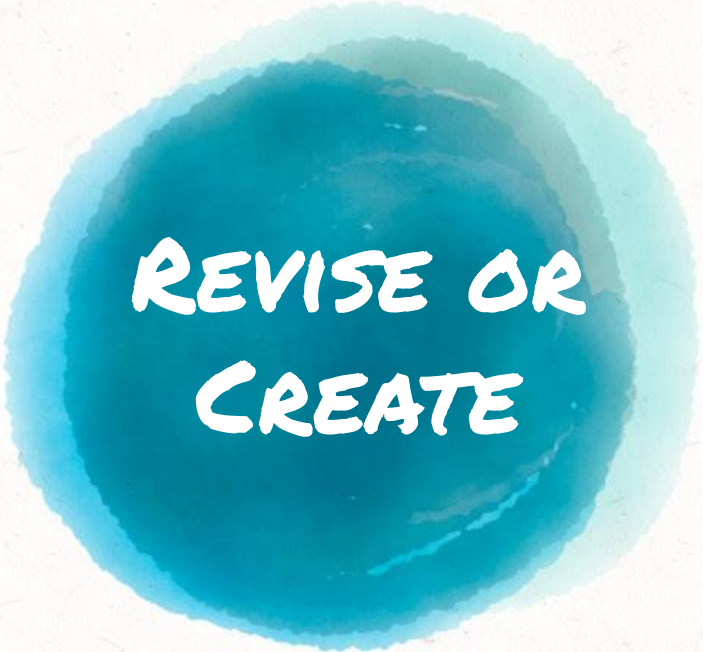
Partner B

1. Listen to Partner A show and share.
2. Take notes.
3. Give feedback.

Swap roles. 5 minutes for each round.



Engineering Design Process



Revise the existing prototype based on feedback or test results.

Construct another physical or digital prototype of your solution based on feedback or test results.

Example solution

Credits

STEM Ready

This lesson was designed for TVA.

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by SlidesCarnival
- Photographs by Unsplash
- Paper backgrounds by SubtlePatterns