



## Innovation Challenge

Getting students to **connect with**, and see **value in**, their ideas is a critical piece of all learning. This is especially true for teaching STEM. Open-ended innovation prompts and challenges are a great way to foster this kind of learning environment as they:

- Give students a chance to explore their own ideas and interests;
- Increase student confidence by validating those same ideas and interests;
- Provide a forum in which students may work independently, as well as collaboratively, and practice giving and receiving respectful feedback; and
- Enable students to implement and practice the engineering design process in a way that is relevant to them.

CreositySpace has compiled a series of community-oriented innovation challenges for you to use with your class.

### Three Easy Steps

1. Pick a Challenge Question
2. Design and Build a Prototype
3. Share a Detailed Drawing or Presentation with Classmates

[Email us](#) for a FREE printable student notebook that your class can use as a guide as they work on their innovations

Check out our [Young Inventors Gallery](#) for inspiration.

## Challenge Questions

### Reduce, Reuse, Recycle!

Last week the world celebrated the 50th anniversary of Earth Day. There were many stories from all over about people working to protect Earth and its natural resources. One action discussed was the effort to reduce the amount of garbage generated by reusing things instead of throwing them away (like this bag my niece made me out of coffee bean bags).



**The challenge is to look around your house and find a new use for something you would otherwise throw away.**

### Rain, Rain, Go Away!

I don't know what the weather is like where you live, but where I am right now it keeps raining. Front yards, schools, parks, and trails are often flooded. Bluffs and coastal roadways at risk of collapse, landslides and sinkholes. There must be something we can do with all this water to protect animal habitats, recreational spaces, and important infrastructure.



**Rain and storms can cause major problems to animal habitats and human infrastructure. Your challenge is to design a way to keep unwanted water out of your space. As an extra challenge, figure out how to put this water to good use!**

*Different solutions styles and/or climate challenges are applicable for different places in the world. Pick challenge parameters that reflect the situation in your area or couple this with a social studies unit and pick challenge parameters that would fit a place you are studying.*

## Fun and Fabulous

Sometimes it's hard to stay focused on your school assignments. Maybe your mind keeps drifting to your favorite toy or game? Let's think about that favorite toy or game. What is it? What is it made of? What, if any, type of waste or garbage does it produce? Is there some way you could change or alter it so that it was more environmentally friendly?



**Your challenge is to take your favorite game or toy and change it to make it more environmentally friendly without making it any less fun. This change could include things such as: the materials it is made from, the amount of energy it takes to use, or the waste it produces.**

## Unwanted guests

"Stop digging!" she yelled at her dog. But it wasn't her dog's fault, there were a new set of holes in the lawn and clearly some tunneling animal had moved in. Her dog was just doing what dogs do—tracking and retrieving small animals. She sighed, and placed a large rock over this latest hole hoping that would deter whichever creature had recently moved in.



**Cold and wet weather has many wild animals and insects looking for a warm, dry place to get food and shelter. Your challenge is to design a way to keep unwanted animals or insects out of your space.**

*Different parts of the world have different climates and animals to contend with. Pick a challenge that is close to home or couple this with a social studies unit and pick a challenge typical to a place you are studying.*

## It was a dark and stormy night...

The wind howled as tree branches scrapped across the roof.

"Please, not again." she whispered.

And then, on cue, as if they had heard her pleas and were openly laughing at her, the lights flickered and went out.

She sighed, grabbed her coat, lit a candle, and curled up on the couch to wait out the latest of the never-ending winter blackouts.



**Wind, rain, snow, icy-all types of weather-can lead to electricity outages (blackouts) in all parts of the country. Your challenge is to look for things around your house or classroom that you could use to invent an electricity generator should your home or school suffer a blackout.**

*Hint: There are a lot of ways to turn the energy of motion (kinetic energy) into electricity (electrical energy).*

## Bug Buffet

The grass in the parks near my home hasn't been cut for weeks. As a result, there are many more small flowers than usual—from the clover and dandelions to violets and other small flowering plants. These flowers make for some happy insect pollinators, such as the bumble bee that let me get close enough to take a picture.



This got me thinking about how the grass is usually kept short leaving the bees, and other insect pollinators, struggling to find food while they wait for summer flowers to bloom.

Pollinators are very important to helping you, and me and farmers grow the food we need to survive.

**Your challenge is to help the bees and design a spring-time pollinator buffet that could help feed the pollinators in early spring.**

## Winter is coming!

Winter is coming to the Northern Hemisphere and this means the rain, snow, wind and cold are coming too! Winter weather brings all types of challenges—from slippery roads to flooding rivers.



**Pick a winter weather-related challenge you face, or someone in your community faces, and design a tool or product to make life easier for them.**

## Can you hear me?

The other day I heard a news story about a gray whale tangled in fishing gear in Puget Sound in the Pacific Northwest. You can read more about it [here](#), but scientist from NOAA spent all day trying to free the whale. They were ultimately successful but it got me thinking how much easier things would have been if they could communicate with the whale? I know it seems like an unrealistic goal—but that's how many great innovations start.



**Your challenge is to pick an animal and design a way to communicate with it. It can just be an initial idea but you should think about how the animal you want to "talk to" communicates normally.**

## Waste Not, Want Not.

Water is crucial to all life on Earth. Think about and explore all the ways you use water at your home. After a summer of record heat waves and tropical storms, providing clean water to our homes, schools, and public buildings can be hard for city water systems.



**Your challenge is to develop an invention to help you reduce, reuse, or recycle water in your house or yard.**

## What a sunny day!

Only a few weeks until summer officially begins (June 20th)—at least for those of us in the Northern Hemisphere! With the days getting longer the amount of sun that shines also increases. How can we take advantage of the longer days and the shining sun?



**Your challenge is to take advantage of the sun by designing a new invention that fits with the prompt: It would be fun if we could put solar panels on...**

## Helping our furry and feathered friends.

The other week I had a chance to chat with my friends in Team 3P in Upstate New York and they were talking about different animal bridges (and tunnels) they were designing. Our discussion provided the inspiration for this challenge question.



**Look around your neighborhood and find a place where animals could use some help getting from one habitat to another. Create a device or structure that will help them move between habitats more safely.**

## Party Time!

Over the last two years people have spent more time in their homes and they've come up with ways to make the space more festive. Some are adding lights or decorations to their patio or backyard. Others are changing around their living room or bedroom space for Friday night fun. What new thing would you like to have at your at-home party?



**Your challenge is to design a new decoration, accessory, game, or toy that you would love to have for your at-home party. It can be whatever you can think up but it has to be a NEW idea or a NEW combination of existing ideas or products.**