K'NEX
K'NEX Vehicle

Design a prototype of a vehicle that moves and add on a new creative component or innovation. What can you add to your vehicle to make it unique?

Mackin Maker

Materials:
- K'NEX Education Maker's Kit Large
- Paper and writing utensil
- Additional materials of your choice (optional)

Quick Start:
1. Gather K'NEX pieces.
2. Brainstorm vehicle possibilities. Sketch out ideas on paper.
3. Do you need any additional materials to make your vehicle become a reality? Find them.
4. Build your vehicle! When you are finished, test it. What can you add or modify to improve it?

Hints and Tips:
- Look at pictures of other vehicles to get ideas and then make them your own to improve them.
- Can you think of ways that your vehicle might be able to collect important data or help the world in some way?

Extended Challenges
Science: Build a rover for exploring Mars. What unique components would you need to collect important data about an unknown planet? Research the methods used in the past and be creative about what you may want to collect in the future.

Science: Build a different machine with wheels that completes a task. What does it do? What are the different features of it? If it exists already, how can you make it better?
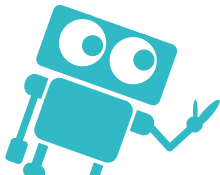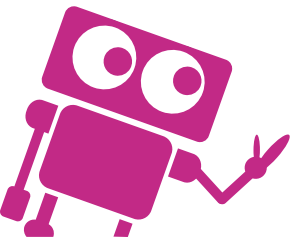
K'NEX
Making a Name for Yourself

Make your name using only K'NEX.

MackinMaker

Materials:
- K'NEX Education Maker's Kit Large

Quick Start:
1. Gather K'NEX pieces.
2. Do you know how to connect and disconnect K'NEX pieces? Experiment until you figure out the best methods.
3. Will you create your name by building a 3D model or 2D shapes that sit on a surface? Decide on your preference and start connecting K'NEX to make your name.

Hints and Tips:
- Smaller pieces connected together allow for more precise shapes (this helps with curved letters like S and B).
- If you are new to using K'NEX, it might help to start by making sure you know how to connect the pieces and break them apart. To attach a rod to a connector, line the rod up on top of an open space on the connector and push down until the rod snaps into place. Connect the open slots on the blue and gray pieces to build in 3D.

Extended Challenges
Social Studies: Instead of your name, make the name of a famous historical leader that you admire. Show your creation with someone you know and talk about why you chose them.
English/Language Arts: Make a new vocabulary word you recently learned.
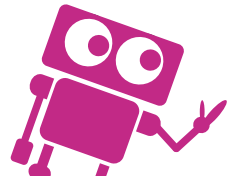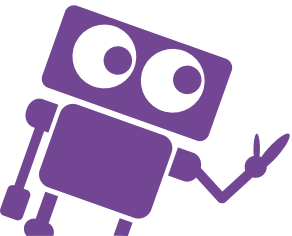
K'NEX
Picture It with K'NEX

Design a picture frame using only K'NEX. Can it stand up on its own?

MackinMaker

Materials:
- K'NEX Education Maker's Kit Large
- Paper
- Pencils and other writing utensils

Quick Start:
1. Gather K'NEX pieces.
2. Brainstorm picture frame possibilities. Gather ideas by thinking about the different components of a picture frame that you need.
3. Build your picture frame! When you are finished, find a picture to test it with. What can you add or modify to improve it?

Hints and Tips:
- Having a hard time coming up with a design? Look at images of picture frames and even K'NEX picture frames if you need to. What are some common elements? What frames do you like the best? Imitate them using K'NEX.
- What picture will you test your frame with? Make sure to measure the size of the picture before you build your frame.

Extended Challenges
Social Studies: Create something to symbolize someone from history that you admire. Sketch your idea and make a frame for your creation using only K'NEX.
English/Language Arts: Write a poem using the form of your choice (concrete poetry, blackout poetry, haiku, free verse, etc.). Make a frame for your poem using only K'NEX.
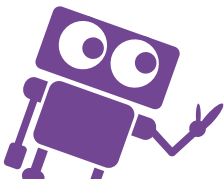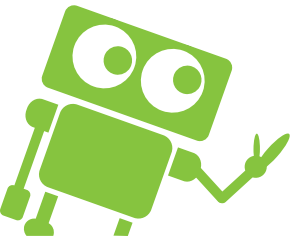
K'NEX
K'NEX Picker Upper

Create a device that picks up trash from the ground. What unique features can you include in this design? Brainstorm, build, and test this prototype.

MackinMaker

Materials:
- K'NEX Education Maker's Kit Large
- Paper and writing utensil
- Additional materials of your choice (optional)

Quick Start:
1. Gather K'NEX pieces.
2. Brainstorm garbage picker upper possibilities. Sketch out ideas on paper.
3. Do you need any additional materials to make your garbage picker upper become a reality?
   Find them.
4. Build your device! When you are finished, test it. What can you add or modify to improve it?

Hints and Tips:
- Having trouble coming up with ideas? Look at images of machines or devices that grab things.
- Start with a type of sweeper or dustpan and build something unique from there.

Extended Challenges
Science: Make a device that is useful for you or others. Would a storage box be useful in helping to store supplies? Would a device to help turn on and off a light switch help to eliminate the spread of germs?
Science: Create a device to hold your phone in place for your desk, your bike, or your car.
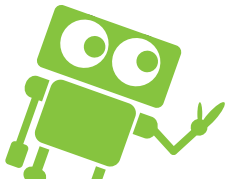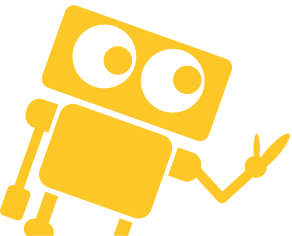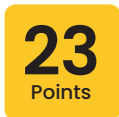
I
Innovator

23
Points

K'NEX
K'NEX Carnival

Create an amusement park ride with at least one moving part. Can you incorporate Hummingbird materials to make it move and/or light up on its own?

MackinMaker

Materials:
- K'NEX Education Maker's Kit Large
- Hummingbird Robotics Premium Kit

Quick Start:
1. Gather K'NEX pieces. Gather your Hummingbird Kit as well if you are choosing to program moving parts.
2. Brainstorm what makes a good amusement park or carnival ride. Sketch out ideas and decide on a design.
3. Build your ride. Program your Hummingbird Bit.
4. When you are finished, test it. What can you add or modify to improve it?

Hints and Tips:
- Need help figuring out which pieces do all the different functions? Look through the kit contents that are laid out in the Hummingbird Robotics Kit user guide.
- Remember, a single-colored LED wire plugs into the terminal a specific way. The colored wire goes into the + terminal, the black wire goes into the – terminal.
- Having trouble figuring out how to program the Hummingbird Bit? Watch one of the tutorials here: **https://www.birdbraintechnologies.com/portal/**

Extended Challenges
English/Language Arts: Create the setting from a story you have recently read.
Social Studies: Create a prototype (or model) of a famous structure. Can you make an Eiffel Tower that lights up? Or a Big Ben?