Try This at Home Science:
Crank Automata

Activity Overview:
Create your own basic automaton driven by a crank mechanism.

Materials:
- A sturdy base; can be made of thick cardboard or wood, a 4x4 inch base should work well.
- Thick cardboard; you will be gluing these together to make a block about half an inch wide.
- Strong wire
- Glue gun
- Square foam
- Scissors
- Printout/drawing of a character or invention you like

Try this:

1. Glue several pieces of thick cardboard together into a block that is about 5 inches tall and 3 inches in width. The block should be at least an inch thick.

2. Make a hole widthwise on the block; feed the wire through. You should have about an inch of wire on both sides.
3. On one side, bend the wire so that it is flat against the block, and then bend it again so it sticks out horizontally. This is your crank. Bend the other side vertically upward, and then back down again to form a U-shape.

4. On the vertical piece of wire, punch a piece of foam into the middle of the wire.

5. On the top of your block, glue a loop (made from either wire or cardboard) that you can feed a separate piece of straight wire through. Once done, punch it into the foam. If you turn the crank, you'll notice the wire now moves up and down and the foam stays in place.
6. Glue a character or invention out of the top so it looks like it’s jumping around as you turn the crank.

7. Once all is put together, glue your base to your block.

What’s happening?
When you turn the crank, U-shaped side begins to alternate- the valley of the U is sometimes lower and sometimes higher. The foam acts as an axle and stays in place because there is very low friction between it and the crank. This coupled with the crank’s motion makes your character move up and down.

How does this relate to real life?
Modern-day car engines, pumps and bicycle pedals all have more advanced crank mechanisms within them. A notable, simpler crank is one we can find in a well. Overall, these mechanisms reduce the amount of effort put into more strenuous work.

Additional Information
To learn more about the history of automata and invention, check out the NISE Network Frankenstein200 kit.

Check out MiSci ECHO Live! “Episode 41: Tinkering with Toys” for a how-to instructional video for this activity!