



Build Your Own Coding Antenna

GRADES 4-6

NASA's Space Communications and Navigation (SCaN) program uses ground station antennas on Earth and satellites in space to help guide and exchange important information for all of NASA's spaceflight missions. Messages are encoded onto radio waves, which are then sent across the galaxy and decoded after reaching their final destination. Practice your engineering skills by decorating and building your own ground station antenna, then use it to help NASA decode the three secret messages below.

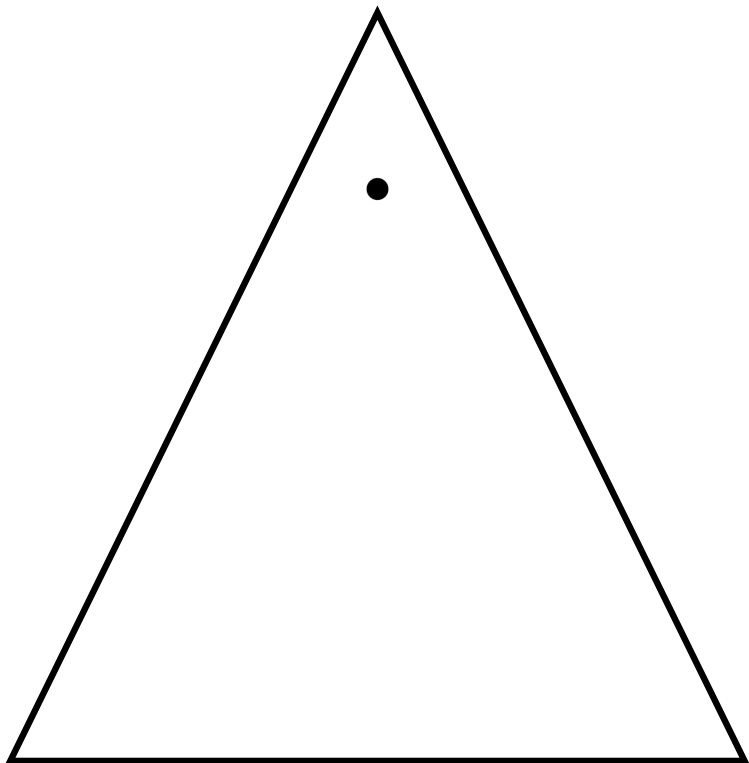
1. Cut out the base, alphabet, and code wheels.
2. Line up the code wheel on top of the alphabet wheel and place a prong through the circle in the center of the code wheel to connect the two pieces and create the dish for your antenna.
3. Place your antenna dish on top of the base and stick the prong through the circle on the base to connect the three pieces of your antenna.
4. Once your antenna is complete, line up the code and alphabet wheels as instructed below to help NASA decode the three secret messages!

To decode the secret messages below line up the letter **A** on the alphabet wheel (outside wheel) with the letter **I** on the code wheel (inside wheel). Find each letter listed below on the inside code wheel. Then find the letter on the outside alphabet wheel that lines up with each coded letter on the inside wheel to decode the three secret messages.

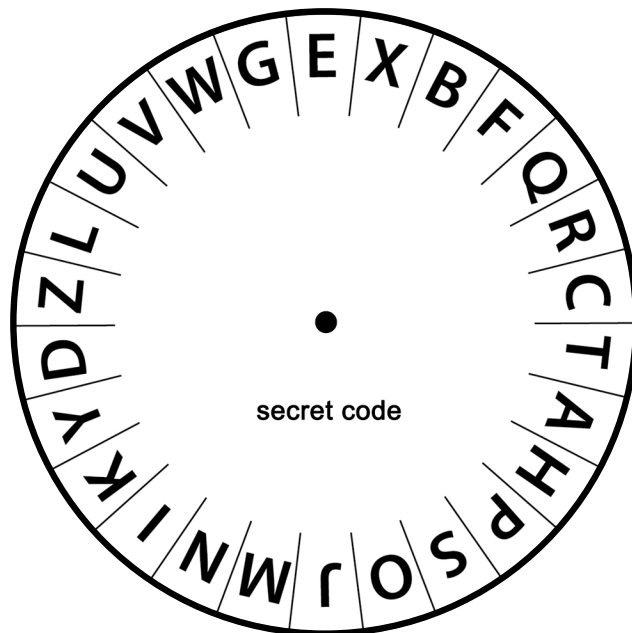
A
I T H Z B W A

B Q Q F X I F D W F U

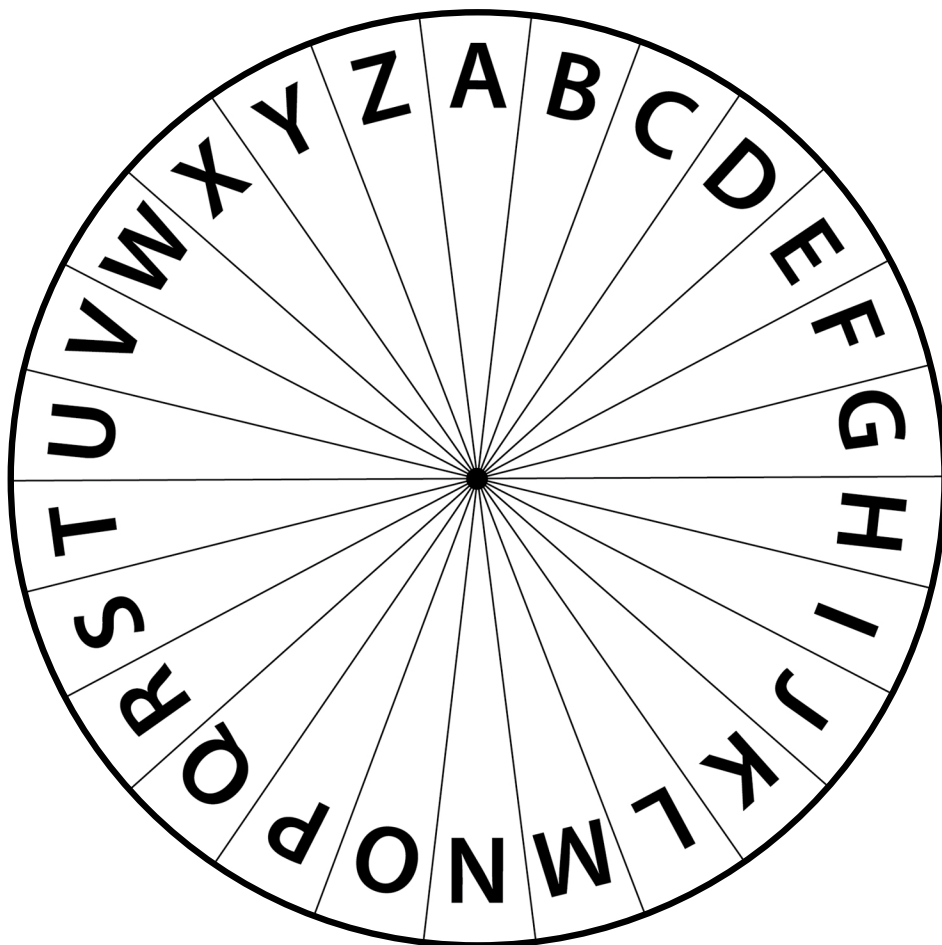
U I X I J M



Base



Code Wheel



Alphabet Wheel

Your ground station
antenna should look
like this when assembled:

