

Innovative Iowans: James Van Allen

Activity Overview: Iowa has been home to many different people who have found careers up in the stars. This month's Innovative Iowan activity is out of this world as it features Iowan James Van Allen. Young historians will bring the stars of the galaxy into their own home by creating a constellation jar.

Connection to Iowa History

Born in Mount Pleasant, Iowa, James Van Allen was always fascinated with science. He received his bachelor's degree in 1935 from Iowa Wesleyan College, and later his master's and PhD from the University of Iowa. Following time in the Navy and work with Applied Physics Laboratory, he served as a professor and head of the department of physics and astronomy at the University of Iowa between 1951-1985. Van Allen is widely recognized for establishing the field of magnetospheric research in space and developing a cosmic-ray detecting device. This device led to the discovery of radiation belts that surround Earth. These belts, which are called the Van Allen radiation belts, are a zone of energetic charged particles which prevent most energetic electrons from reaching Earth. Van Allen passed away in 2006.



Instructions ([Video Instructions Available](#))

- 1 Prep.** Select a jar to use and gather all the needed materials required for this activity.
- 2 Cut.** Using scissors, cut a piece of aluminum foil long enough to wrap around the jar with a little overlap and tall enough to reach from the bottom to the top of the jar. The cut piece of the foil should cover the entire jar. Set aside the piece of foil after cutting.
- 3 Research.** Head online or check out a book to research and find different constellation patterns you want to recreate in the foil. If you would rather create your own designs, sketch out your ideas before moving to the next step.
- 4 Poke.** Use either a pen, pencil or push pin to poke holes in the foil to follow the shapes of the chosen constellation patterns or your own designs. Be sure to create holes of varying sizes to create interest. These holes will eventually look like stars when the jar is lit.
- 5 Fill.** Fill in the rest of the foil with additional smaller holes to represent other stars and allow more light to shine through the constellation jar.
- 6 Cover.** After all the holes have been poked through the foil, wrap the aluminum foil around the outside of the jar. Use tape to connect the two ends together to snugly fit around the jar.
- 7 Light.** Place a battery-powered tea light inside the covered jar. When in a dark space, turn on the candle to see all the stars created by the holes in the jar.

Materials

- Wide Mouth Jar
- Aluminum Foil
- Pen/Pencil/Push Pin
- Scissors
- Tape
- Battery Operated Tea Light

Instructions continued on next page

Innovative Iowans: James Van Allen

Instructions continued

8 Share! After you make your constellation jar, share your results with the State Historical Museum of Iowa. Email a photo to museum.education@iowa.gov. We want to share your creation with others!

9 Questions to Spark Learning

- If you discovered a star, what would you want to name your discovery?
- Why do you think Van Allen's discovery of radiation belts was important?
- Would you want to go into space? Why or why not?

10 Additional Resources

If your young historian would like to learn more about this topic, explore these additional resources below.

- [James Van Allen Biography](#) - University of Iowa
- [James Van Allen Biography](#) - National Academy of Sciences
- [Radiation Belts](#) - NASA
- [The Constellations](#) - International-Astronomical Union