

ICESat-2 SEA ICE TOWERS ACTIVITY INSTRUCTIONS

Background

In the Arctic, sea ice (frozen ocean water) grows and shrinks depending on the season. Satellites have been measuring the sea ice extent since the late 1970's, and only in a 40-year period, rapid changes have occurred. Sea ice is important in regulating our global climate and to keep the planet cool. ICESat-2 is the newest generation of Earth monitoring satellites launched in 2018, currently taking measurements of the ice, as well as trees, land, oceans, and clouds. ICESat-2 will provide scientists with important measurements of sea ice coverage and thickness to continue learning about how our polar regions are changing.

For more information on sea ice and ICESat-2, check out:

- NASA visualization sea ice animation 1980-2019: <https://svs.gsfc.nasa.gov/4786>
- Earth Observatory article: <https://earthobservatory.nasa.gov/features/SeaIcepage3.php>
- ICESat-2 mission website: <https://icesat-2.gsfc.nasa.gov/>.

Hands-on Activity

The Sea Ice Towers Activity is for elementary level children and shows graphically in three dimensions how the sea ice is changing over the years.

The data consists of numbers rounded up or down of yearly averages of sea ice cover in summer at its lowest extent over a 40-year period (1980 – 2019). The numbers represent millions of kilometers squared.

Materials you need:

- A flat surface like a tabletop or bare floor
- Data sheet on Page 2 of this document (can print out or copy on a piece of paper)
- Blocks (unifix cubes, dominoes, or anything that will stack in a vertical tower)

Note: You will need 31 blocks.

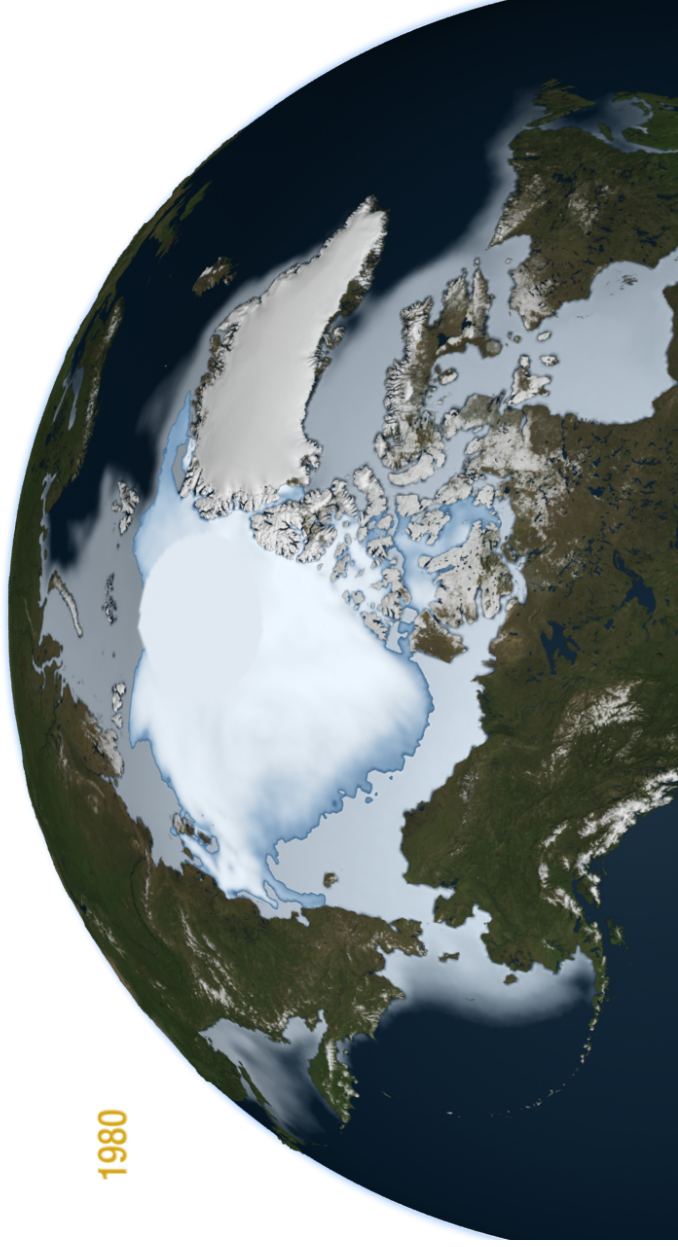
Instructions:

Gather your blocks and use the Data Sheet on the next page. look at the graph below the picture and assemble the number of blocks from each of the corresponding year boxes and place their assembled tower into the corresponding blank box at the top of the chart. Each cube represents 1 million square kilometers. Note, for comparison: The surface area of the U.S. is 8 million square kilometers or 8 blocks. The State of California = $\frac{1}{2}$ a cube.

SEA ICE TOWERS

1980	1990	2000	2007	2012	2019

Arctic, North Pole



1980	1990	2000	2007	2012	2019
8	6	6	4	3	4

Note: Sea Ice 1980-2019 (millions of KM^2) summer minimum. (Photo above shows ice coverage in 1980.) Number inside box represents number of cubes. Each cube = 1 million KM^2 . For comparison, the contiguous US = 8 million KM^2 or 8 blocks. State of California = $\frac{1}{2}$ a cube.