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# Applications of VR Learning as Classroom Tools

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## WHAT MAKES VR EFFECTIVE FOR CLASSROOMS?

“Curriculum design and lesson plan development is critical. The pedagogy and learning science theory integration is what pushes the technology beyond the initial novelty effect.”

### Tours must be:

- Embedded in curriculum with support for teachers and students
- Based on authentic contexts and recreate a semblance of reality
- Interactive and goal directed



## VR TOURS MOST EFFECTIVE WHEN EMBEDDED IN CURRICULA

### Connection to Place

### Connection to Fieldwork & Data

### Integrate Innovative Pedagogy

## POLARPASS INTERACTIVE ENVIRONMENTS

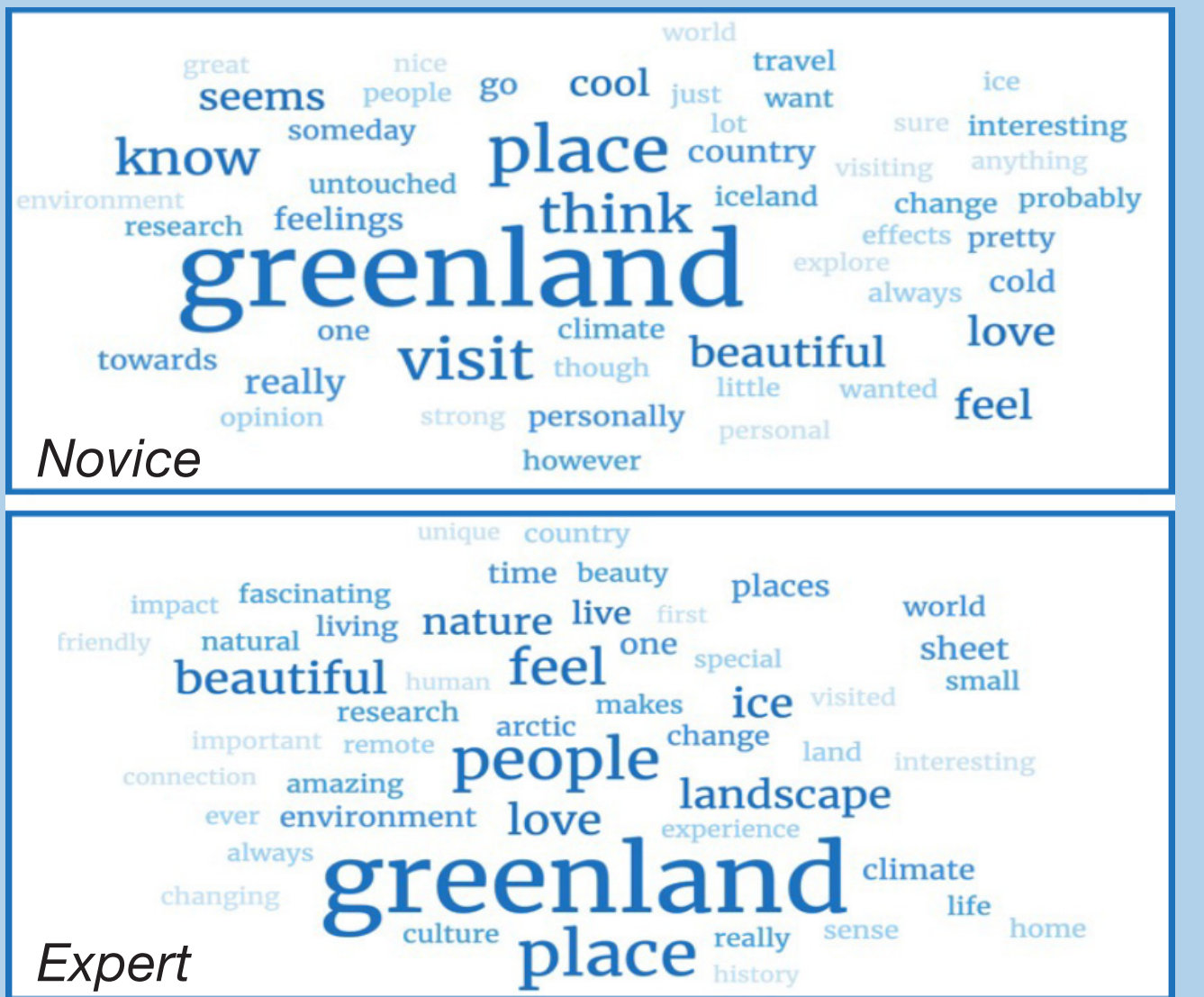
What is the geography and what are the system components of a Greenland glacier basin system?

### Glacier basin system Objective and Learning Goals

- Develop sense of place for the Kangerlussuaq glacier basin system
- To visually explore the Watson River watershed

### Sense of Place Research

An assessment of the connection someone has to a place. Research shows that students who used the PolarPASS tours embedded into curriculum has a deeper sense of place than those who did not.



### PolarPASS is designed to

- Bring real polar data into the undergraduate classroom
- Strengthen students' knowledge of polar science
- Build student connections to polar places

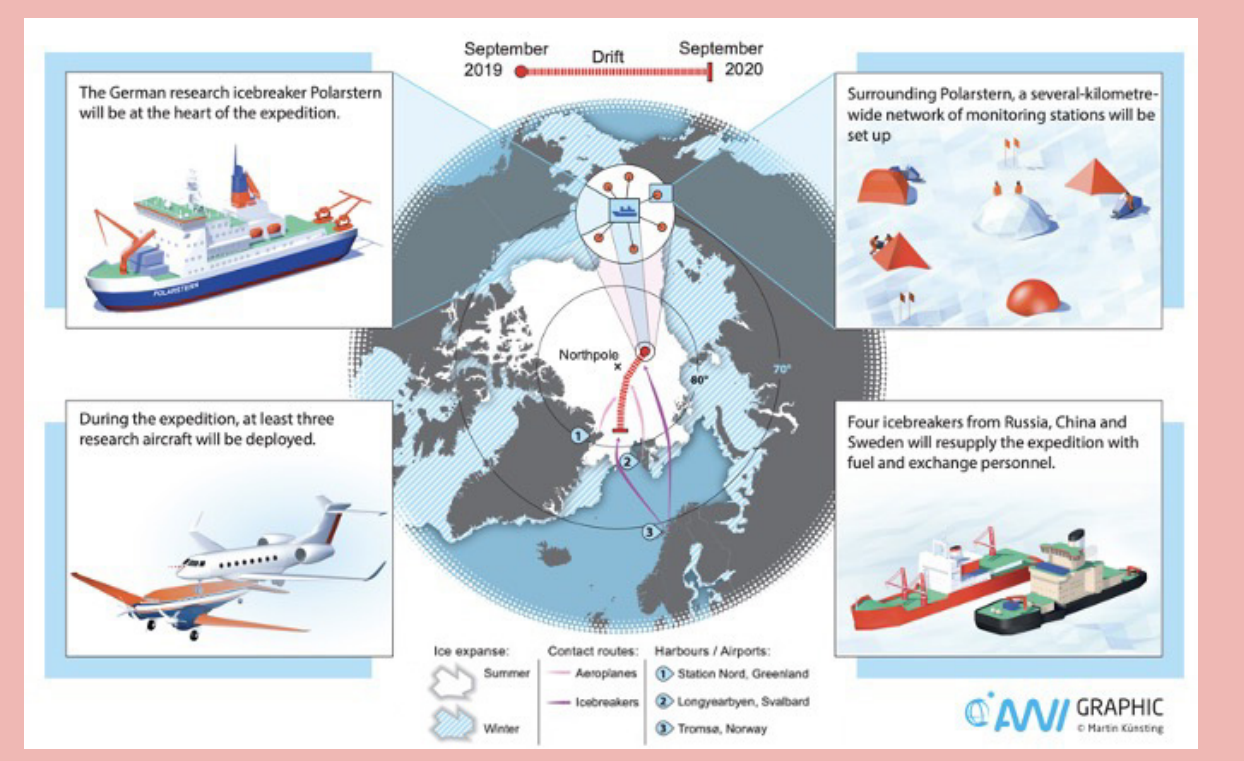
360 interactive environments and GIS components are embedded into the curricula.



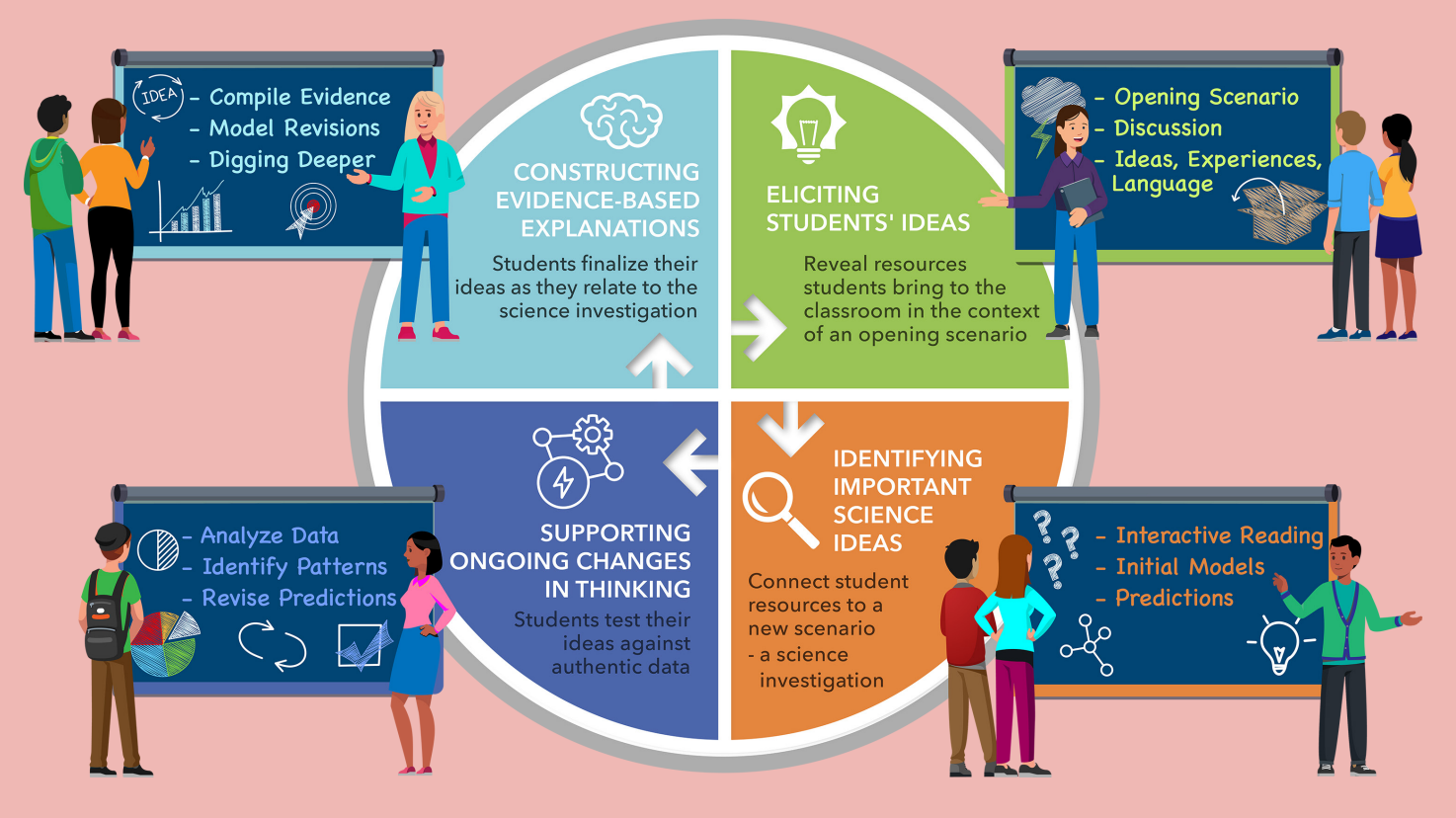
PolarPass VR Tour: [storage.net-fs.com/hosting/7431747/4/](https://storage.net-fs.com/hosting/7431747/4/)

## 2019-2020 MOSAIC EXPEDITION

One of the largest Arctic research expeditions ever with 500+ scientists from 19 countries studying the changing Arctic climate system – ocean, ice, atmosphere, and ecosystem processes.



360° images from the expedition to construct VR tours intended to bring students to the ice! These VR tours were embedded into Data Puzzles, 3-day lessons in which students analyze a dataset to make sense of science phenomena.



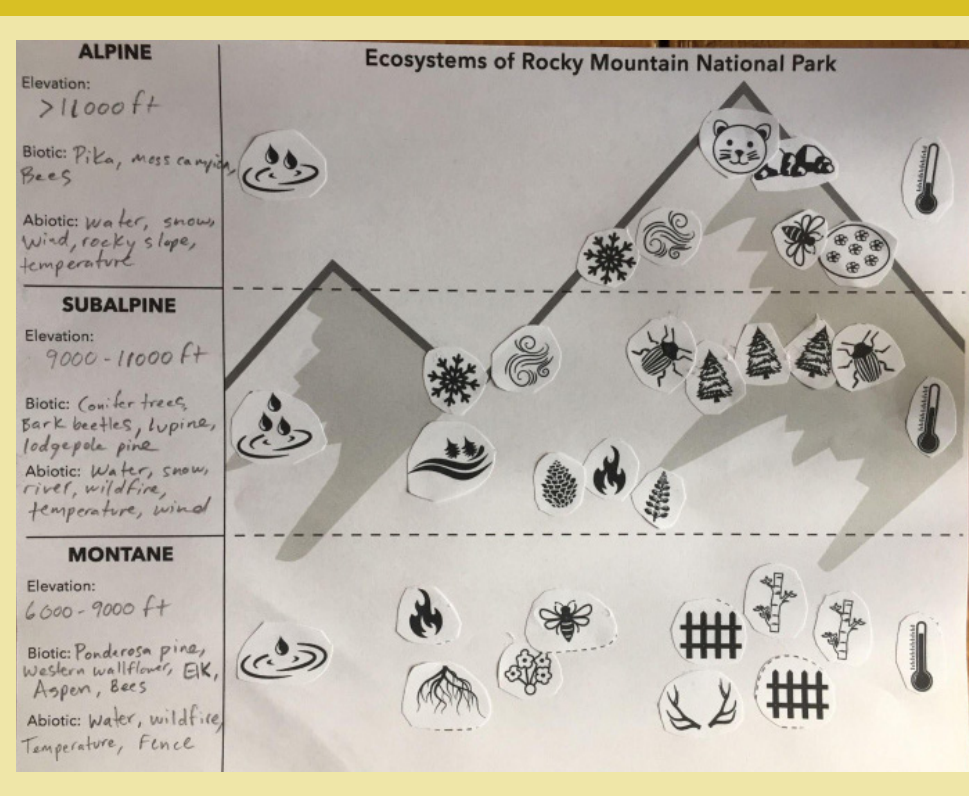
Co-developed by MOSAIC scientist Gina Jozef and the CIRES EO team, the *It's All Connected* Data Puzzle challenges students to analyze a humidity dataset Gina collected in the Arctic with her drone, the DataHawk2, to answer the question, “What effect, if any, do leads (large cracks in sea ice) have on the transfer of moisture between the ocean and atmosphere?”



MOSAIC VR Tour: [cires.colorado.edu/outreach/sites/default/files/application/icefloe/](https://cires.colorado.edu/outreach/sites/default/files/application/icefloe/)

## ECOSYSTEMS OF ROCKY MOUNTAIN NATIONAL PARK

Before students engage with the tour, they complete a pre-assessment, creating an initial RMNP ecosystem model by arranging biotic and abiotic graphics into different ecosystem types on their worksheet.



Then, students explore the VR tour, clicking on the blue “point of interest” icons and taking notes on which ecosystem the biotic and abiotic graphics they just arranged are located.



Last, students revise their initial RMNP ecosystem models by rearranging the biotic and abiotic graphics on their worksheets based on what they learned from the VR tour.



Ecosystems of RMNP VR Tour: [storage.net-fs.com/hosting/7431747/8/](https://storage.net-fs.com/hosting/7431747/8/)