What if Mathematics was a place? Teachers' notes

Background

A metaphor is a figure of speech, where one thing is described by comparing it directly to another, unrelated thing to illustrate its characteristics. Developing a metaphor is one form of modeling an idea or situation. The purpose of this task is to provide a student with the opportunity to represent their understanding of the elements of mathematics as a model that is like the map of a place, or the model of a system. This task requires the student to think about connections and relationships in mathematics and to be creative as they compare these connections and relationships to ones that exist in other contexts.

The resulting student work will provide you with an assessment opportunity that will allow you to determine the strength of the network of understanding and the possible misconceptions or areas or understanding and knowledge that need to be further explored or developed.

Suggestions:

The thumbnails provide examples of other students' work to motivate or provide visual references. Looking at these together and critiquing the elements may support a younger student to get started.

The brainstorming prompt is important in getting the vocabulary and connections down somewhere for future reference. When looking at the student's drafts you with them, you can refer back to the vocabulary and ask "What about this idea- where do exponents fit in your map? What about the relationship between multiplication and division- how will you show that?" "Would a 3-D model suit your ideas better?"

The task can be adapted to be metaphors or models other than maps to engage your student's specific interests - a more systemic approach could see the creation of a model that is like a circulatory system or a food chain or a railroad or architectural models such as a skyscraper or a series of bridges. A student may also wish to create characters to represent the "personalities" of the operations.

Next steps could be a further investigation of mapping and working with latitude and longitude, or further work with modeling of 3-D such as topographical maps or satellite images.