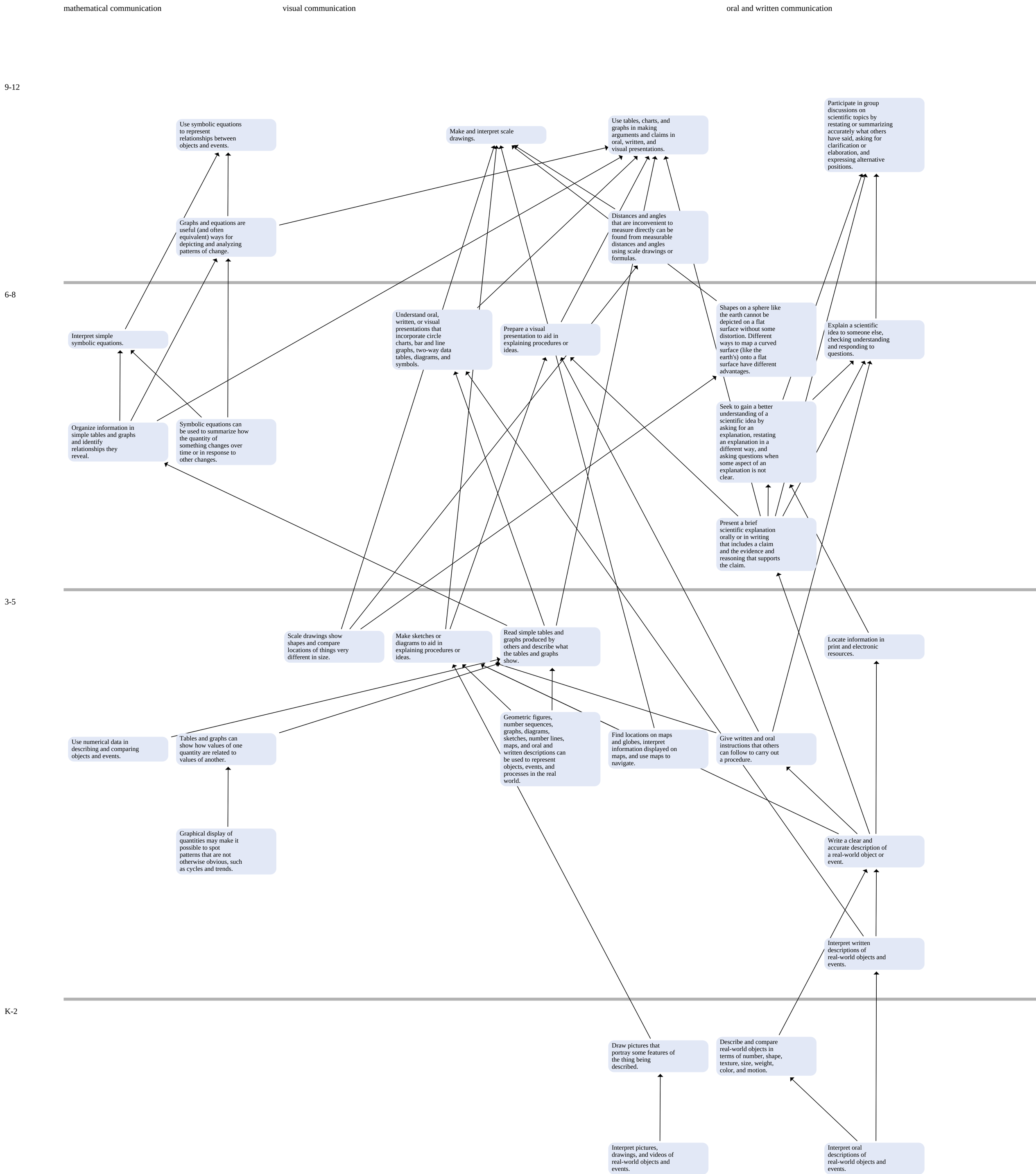
mathematical communication
visual communication
oral and written communication
9-12
6-8
3-5
K-2
Use symbolic equations to represent relationships between objects and events.
Make and interpret scale drawings.
Use tables, charts, and graphs in making arguments and claims in oral, written, and visual presentations.
Participate in group discussions on scientific topics by restating or summarizing accurately what others have said, asking for clarification or elaboration, and expressing alternative positions.
Graphs and equations are useful (and often equivalent) ways for depicting and analyzing patterns of change.
Distances and angles that are inconvenient to measure directly can be found from measurable distances and angles using scale drawings or formulas.
Understand oral, written, or visual presentations that incorporate circle charts, bar and line graphs, two-way data tables, diagrams, and symbols.
Prepare a visual presentation to aid in explaining procedures or ideas.
Shapes on a sphere like the earth cannot be depicted on a flat surface without some distortion. Different ways to map a curved surface (like the earth's) onto a flat surface have different advantages.
Explain a scientific idea to someone else, checking understanding and responding to questions.
Interpret simple symbolic equations.
Organize information in simple tables and graphs and identify relationships they reveal.
Symbolic equations can be used to summarize how the quantity of something changes over time or in response to other changes.
Seek to gain a better understanding of a scientific idea by asking for an explanation, restating an explanation in a different way, and asking questions when some aspect of an explanation is not clear.
Present a brief scientific explanation orally or in writing that includes a claim and the evidence and reasoning that supports the claim.
Scale drawings show shapes and compare locations of things very different in size.
Make sketches or diagrams to aid in explaining procedures or ideas.
Read simple tables and graphs produced by others and describe what the tables and graphs show.
Locate information in print and electronic resources.
Use numerical data in describing and comparing objects and events.
Tables and graphs can show how values of one quantity are related to values of another.
Geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and oral and written descriptions can be used to represent objects, events, and processes in the real world.
Find locations on maps and globes, interpret information displayed on maps, and use maps to navigate.
Give written and oral instructions that others can follow to carry out a procedure.
Graphical display of quantities may make it possible to spot patterns that are not otherwise obvious, such as cycles and trends.
Write a clear and accurate description of a real-world object or event.
Interpret written descriptions of real-world objects and events.
Draw pictures that portray some features of the thing being described.
Describe and compare real-world objects in terms of number, shape, texture, size, weight, color, and motion.
Interpret pictures, drawings, and videos of real-world objects and events.
Interpret oral descriptions of real-world objects and events.