

## **About the Earth and Space Sciences Reference Tables**

The Earth and Space Sciences Reference Tables (ESSRT), 2024 edition should be used in the classroom beginning in the 2024-2025 school year. The first examination for which these tables will be used is the June 2025 Regents Examination in Earth and Space Sciences. The ESSRT contains information that students are expected to locate and apply in multiple contexts to be used as evidence, in support of developing conceptual understanding of the three dimensions referenced in the Performance Expectations (PE), but not necessarily memorize. Teachers should use these reference tables in instruction throughout the Earth and Space Sciences course and to familiarize students with the content and Geologic/Geographic features specific to New York State. The table of contents provided on page 1, organizes the ESSRT by topic and the primary PE that specific information and/or the table(s) is aligned to.

### **How were the Earth and Space Sciences Reference Tables developed?**

The New York State Education Department (NYSED) convened a group of NYS science educators to develop the initial draft of the Earth and Space Sciences Reference Tables. In developing the ESSRT, participants considered the Performance Expectations, and how each table could be used to support conceptual understanding. This process was repeated for all Performance Expectations in the course. Not all Performance Expectations lend themselves to evidence from the tables, graphs, maps and infographics included in this new version of ESSRT, and thus are not included. The Office of State Assessment collaborated with State scientists from the NYS Museum to produce select tables and maps in the ESSRT and provide the most up-to-date data and scientifically accurate information. The draft ESSRT then went through additional rounds of review and edits from NYS-certified educators, content specialists, and assessment experts under NYSED supervision.

### **How can the ESSRT be used in Instruction?**

With the transition to the New York State P-12 Science Learning Standards (NYSP-12SLS), supporting shifts in instruction and assessment necessitates a change in the functionality of the ESSRT. Such updates include but are not limited to how students will: use evidence from multiple sources to construct explanations, engage in arguments from evidence, and use a model to explain scientific ideas as opposed to reading the tables to identify the correct answer.

The bullet points below are some ways in which teachers and students can expect to utilize the ESSRT in instruction:

- As evidence to support claims or construct an argument that incorporates Disciplinary Core Ideas and Crosscutting Concepts around specific PEs (construct an argument based on evidence);
- To apply (practice) the Science and Engineering Practices;
- Synthesis of multiple maps/tables/graphs/etc. to support Crosscutting Concepts and Scientific Practices; and
- To reinforce/expand on Disciplinary Core Ideas (concepts and knowledge).

### How can the ESSRT be used in Assessment?

The bullet points below are some ways in which teachers and students can expect to utilize the ESSRT for assessment:

- As initial stimuli to engage students in a phenomenon that begins a storyline and application of Scientific Practices and Crosscutting Concepts;
- As secondary stimuli to clusters/topics; support existing stimuli;
- Provide evidence (e.g., to support/refute claims) for items in clusters; and
- Resource for frames of reference related to the Earth and Space Sciences topics.

Please keep in mind, the reference tables are not intended to be used as a curriculum guide; they are a resource to support instruction and assessment.

### ESSRT Notes and Guidance for Science Educators

The table below highlights guidance regarding specific ESSRT components that support three-dimensional instruction and assessment. Teachers may utilize the following guidance to support students in synthesizing information and applying scientific practices to communicate scientific understanding.

Page #	Notes and Guidance
2	<ul style="list-style-type: none"> <li>• Axial tilts indicate the degree location of the celestial object's north pole.</li> </ul>
4	<ul style="list-style-type: none"> <li>• There are multiple axes (Luminosity, Solar Radius), Star Lifetimes (some are indicated and specific to a star, and others are general to that area), Spectral Class – based on temperature, color, spectral characteristics O-M (Hot - Cool)</li> </ul>
6,7	<ul style="list-style-type: none"> <li>• There are more detailed epochs. These dates came from the International Chronostratigraphic Chart (2023).</li> <li>• There are <i>five</i> mass extinctions.</li> </ul>

	<ul style="list-style-type: none"> <li>○ The mass extinction in the late Devonian occurs before the end of the Devonian period</li> <li>● <b>Bold</b> text indicates evidence for events that have taken place in New York State. The <b>bold</b> black arrow signifies a continuation of the time from the Precambrian Eon to the Phanerozoic Eon.</li> <li>● AA, BB Holocene index fossils occurred at the same time.</li> <li>● Time Distribution of Fossils includes a difference in shading signifying the level of diversity, dark gray – light gray (greater diversity – lower diversity). <ul style="list-style-type: none"> <li>○ *Please note, that this shading does not indicate abundance, rather the degree of diversity</li> </ul> </li> <li>● Inferred position of Earth's Land Masses have been updated (illustrating the changing shape and location of the proto-North American continent)</li> <li>● Important Geologic Events: Gray box extends below the Cambrian representing 539 mya</li> </ul>
<b>8, 9</b>	<ul style="list-style-type: none"> <li>● Additional cities of geologic interest have been included on these maps and are indicated with dots that are accompanied by circled numbers.</li> <li>● Some gas fields are small and appear as small circular/irregular shapes.</li> </ul>
<b>10</b>	<ul style="list-style-type: none"> <li>● Important to note that the geographic province and landscape regions are denoted by different typefaces (fonts).</li> </ul>
<b>12</b>	<ul style="list-style-type: none"> <li>● White area on the map along the edges of coastlines indicate continental shelves. White indicates continental bedrock, gray indicates oceanic bedrock.</li> <li>● Map includes spreading rates for tectonic plates.</li> <li>● Be sure to remind students that tectonic plates include both continental crust and oceanic crust.</li> <li>● Hawaiian Islands are not to scale.</li> <li>● New symbols for tectonic plate interactions found in the key (e.g., active ridges)</li> </ul>
<b>13</b>	<ul style="list-style-type: none"> <li>● Igneous rock names are indicated by bullets (Model of Bowen's Reaction Series)</li> </ul>
<b>14</b>	<ul style="list-style-type: none"> <li>● This infographic is a new way to view the processes included within the rock cycle. This allows the integration of Earth systems processes and not only includes rock types and processes, but also the environment of formation. This does not illustrate a stratigraphic sequence of geologic history.</li> </ul>
<b>16, 17</b>	<ul style="list-style-type: none"> <li>● The mineral ID flowchart begins on page 16 or page 17 by first identifying a mineral's luster. Other mineral properties are then used for mineral identification.</li> <li>● The MOHs Hardness Scale has been added to page 16.</li> </ul>
<b>18,19</b>	<ul style="list-style-type: none"> <li>● Information on these pages supplement instruction and</li> </ul>

	<p>assessment of the Weather and Climate PEs.</p> <ul style="list-style-type: none"><li>• *Please note, all reference materials needed for the Investigation – The Sky is the Limit, are included in the Weather Information Packet for that Investigation. The ESSRT will not need to be utilized.</li></ul>
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NYSED does not provide printed copies of the regular or translated-edition reference tables. It is important that printer settings such as full, actual size, or 100% are used when printing any of the ESSRT components to ensure their accuracy.