Process Skill Levels for Data Usage

Brandon Lawton (STScI), Denise Smith (STScI), Bonnie Eisenhamer (STScI), Holly Ryer (STScI), and the NASA SMD Astrophysics E/PO Community

1. **Basic**—with an emphasis on visual data, images, and representations. (e.g., observing, comparing, and classifying)

2. **Extended**—with an emphasis on numeric data, data collection, and computational tasks (e.g., inferring, measuring, calculating, communicating, and predicting)

3. **Integrated**—with an emphasis on experimental design, interpreting data, and identifying patterns, trends, and relationships. (e.g., controlling variables, defining operationally, formulating hypothesis, interpreting data—including knowing the uncertainties, experimentation, and formulating models)

4. **Science Process Applications**—with an emphasis on students working independently with authentic data and conducting real-world research. Students use data to carry out a contemporary research project—reproducing known results with a new sample or finding new results altogether.