

# ▶ SCIENCE

These Standards describe what students who score in specific score ranges on the science section of the ACT® college readiness assessment are likely to know and be able to do.

| SCORE RANGE | INTERPRETATION OF DATA (IOD)  |
|-------------|---|
| 13-15       | <p><b>IOD 201.</b> Select one piece of data from a simple data presentation (e.g., a simple food web diagram)</p> <p><b>IOD 202.</b> Identify basic features of a table, graph, or diagram (e.g., units of measurement)</p> <p><b>IOD 203.</b> Find basic information in text that describes a simple data presentation</p>   |
| 16-19       | <p><b>IOD 301.</b> Select two or more pieces of data from a simple data presentation</p> <p><b>IOD 302.</b> Understand basic scientific terminology</p> <p><b>IOD 303.</b> Find basic information in text that describes a complex data presentation</p> <p><b>IOD 304.</b> Determine how the values of variables change as the value of another variable changes in a simple data presentation</p>         |
| 20-23       | <p><b>IOD 401.</b> Select data from a complex data presentation (e.g., a phase diagram)</p> <p><b>IOD 402.</b> Compare or combine data from a simple data presentation (e.g., order or sum data from a table)</p> <p><b>IOD 403.</b> Translate information into a table, graph, or diagram</p> <p><b>IOD 404.</b> Perform a simple interpolation or simple extrapolation using data in a table or graph</p> |

Students who score in the 1-12 range are most likely beginning to develop the knowledge and skills assessed in the other ranges.

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**THE ACT COLLEGE READINESS BENCHMARK FOR SCIENCE IS 23.** Students who achieve this score on the ACT Science Test have a 50% likelihood of achieving a B or better in a first-year Biology course at a typical college. The knowledge and skills highly likely to be demonstrated by students who meet the Benchmark are shaded.

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| SCORE RANGE | INTERPRETATION OF DATA (IOD)   |
|-------------|--|
| 24-27       | <p><b>IOD 501.</b> Compare or combine data from two or more simple data presentations (e.g., categorize data from a table using a scale from another table)</p> <p><b>IOD 502.</b> Compare or combine data from a complex data presentation</p> <p><b>IOD 503.</b> Determine how the values of variables change as the value of another variable changes in a complex data presentation</p> <p><b>IOD 504.</b> Determine and/or use a simple (e.g., linear) mathematical relationship that exists between data</p> <p><b>IOD 505.</b> Analyze presented information when given new, simple information</p> |
| 28-32       | <p><b>IOD 601.</b> Compare or combine data from a simple data presentation with data from a complex data presentation</p> <p><b>IOD 602.</b> Determine and/or use a complex (e.g., nonlinear) mathematical relationship that exists between data</p> <p><b>IOD 603.</b> Perform a complex interpolation or complex extrapolation using data in a table or graph</p>  |
| 33-36       | <p><b>IOD 701.</b> Compare or combine data from two or more complex data presentations</p> <p><b>IOD 702.</b> Analyze presented information when given new, complex information</p>  |

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| SCORE RANGE | SCIENTIFIC INVESTIGATION (SIN)  |
|-------------|---|
| 13-15       | <p><b>SIN 201.</b> Find basic information in text that describes a simple experiment</p> <p><b>SIN 202.</b> Understand the tools and functions of tools used in a simple experiment</p>   |
| 16-19       | <p><b>SIN 301.</b> Understand the methods used in a simple experiment</p> <p><b>SIN 302.</b> Understand the tools and functions of tools used in a complex experiment</p> <p><b>SIN 303.</b> Find basic information in text that describes a complex experiment</p>   |
| 20-23       | <p><b>SIN 401.</b> Understand a simple experimental design</p> <p><b>SIN 402.</b> Understand the methods used in a complex experiment</p> <p><b>SIN 403.</b> Identify a control in an experiment</p> <p><b>SIN 404.</b> Identify similarities and differences between experiments</p> <p><b>SIN 405.</b> Determine which experiments utilized a given tool, method, or aspect of design</p> |

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| SCORE RANGE         | SCIENTIFIC INVESTIGATION (SIN)  |
|---------------------|---|
| <p><b>24-27</b></p> | <p><b>SIN 501.</b> Understand a complex experimental design</p> <p><b>SIN 502.</b> Predict the results of an additional trial or measurement in an experiment</p> <p><b>SIN 503.</b> Determine the experimental conditions that would produce specified results</p>                                 |
| <p><b>28-32</b></p> | <p><b>SIN 601.</b> Determine the hypothesis for an experiment</p> <p><b>SIN 602.</b> Determine an alternate method for testing a hypothesis</p>   |
| <p><b>33-36</b></p> | <p><b>SIN 701.</b> Understand precision and accuracy issues</p> <p><b>SIN 702.</b> Predict the effects of modifying the design or methods of an experiment</p> <p><b>SIN 703.</b> Determine which additional trial or experiment could be performed to enhance or evaluate experimental results</p> |

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| SCORE RANGE | EVALUATION OF MODELS, INFERENCES, AND EXPERIMENTAL RESULTS (EMI)  |
|-------------|---|
| 13-15       | <p><b>EMI 201.</b> Find basic information in a model (conceptual)</p>   |
| 16-19       | <p><b>EMI 301.</b> Identify implications in a model</p> <p><b>EMI 302.</b> Determine which models present certain basic information</p>   |
| 20-23       | <p><b>EMI 401.</b> Determine which simple hypothesis, prediction, or conclusion is, or is not, consistent with a data presentation, model, or piece of information in text</p> <p><b>EMI 402.</b> Identify key assumptions in a model</p> <p><b>EMI 403.</b> Determine which models imply certain information</p> <p><b>EMI 404.</b> Identify similarities and differences between models</p> |

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| SCORE RANGE         | EVALUATION OF MODELS, INFERENCES, AND EXPERIMENTAL RESULTS (EMI)   |
|---------------------|--|
| <p><b>24-27</b></p> | <p><b>EMI 501.</b> Determine which simple hypothesis, prediction, or conclusion is, or is not, consistent with two or more data presentations, models, and/or pieces of information in text</p> <p><b>EMI 502.</b> Determine whether presented information, or new information, supports or contradicts a simple hypothesis or conclusion, and why</p> <p><b>EMI 503.</b> Identify the strengths and weaknesses of models</p> <p><b>EMI 504.</b> Determine which models are supported or weakened by new information</p> <p><b>EMI 505.</b> Determine which experimental results or models support or contradict a hypothesis, prediction, or conclusion</p> |
| <p><b>28-32</b></p> | <p><b>EMI 601.</b> Determine which complex hypothesis, prediction, or conclusion is, or is not, consistent with a data presentation, model, or piece of information in text</p> <p><b>EMI 602.</b> Determine whether presented information, or new information, supports or weakens a model, and why</p> <p><b>EMI 603.</b> Use new information to make a prediction based on a model</p>  |
| <p><b>33-36</b></p> | <p><b>EMI 701.</b> Determine which complex hypothesis, prediction, or conclusion is, or is not, consistent with two or more data presentations, models, and/or pieces of information in text</p> <p><b>EMI 702.</b> Determine whether presented information, or new information, supports or contradicts a complex hypothesis or conclusion, and why</p>   |

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ACT College and Career Readiness Standards for Science are measured in rich and authentic contexts based on science content that students encounter in science courses. This content includes:

| <b>LIFE SCIENCE/BIOLOGY</b>   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Animal behavior</li> <li>• Animal development and growth</li> <li>• Body systems</li> <li>• Cell structure and processes</li> <li>• Ecology</li> <li>• Evolution</li> <li>• Genetics</li> <li>• Homeostasis</li> <li>• Life cycles</li> </ul>  | <ul style="list-style-type: none"> <li>• Molecular basis of heredity</li> <li>• Origin of life</li> <li>• Photosynthesis</li> <li>• Plant development, growth, structure</li> <li>• Populations</li> <li>• Taxonomy</li> </ul>                      |
| <b>PHYSICAL SCIENCE/CHEMISTRY, PHYSICS</b>  |   |
| <ul style="list-style-type: none"> <li>• Atomic structure</li> <li>• Chemical bonding, equations, nomenclature, reactions</li> <li>• Electrical circuits</li> <li>• Elements, compounds, mixtures</li> <li>• Force and motions</li> <li>• Gravitation</li> <li>• Heat and work</li> <li>• Kinetic and potential energy</li> </ul> | <ul style="list-style-type: none"> <li>• Magnetism</li> <li>• Momentum</li> <li>• The periodic table</li> <li>• Properties of solutions</li> <li>• Sound and light</li> <li>• States, classes, and properties of matter</li> <li>• Waves</li> </ul> |
| <b>EARTH AND SPACE SCIENCE</b>  |   |
| <ul style="list-style-type: none"> <li>• Earthquakes and volcanoes</li> <li>• Earth’s atmosphere</li> <li>• Earth’s resources</li> <li>• Fossils and geological time</li> <li>• Geochemical cycles</li> <li>• Groundwater</li> <li>• Lakes, rivers, oceans</li> <li>• Mass movements</li> <li>• Plate tectonics</li> </ul>        | <ul style="list-style-type: none"> <li>• Rocks, minerals</li> <li>• Solar system</li> <li>• Stars, galaxies, and the universe</li> <li>• Water cycle</li> <li>• Weather and climate</li> <li>• Weathering and erosion</li> </ul>                    |