

# WGU GUIDE FOR SECONDARY SCIENCE PRAXIS® EXAM

Updated by the WGU Secondary Education Science Team

## Start here

This guide will help you get started with your Praxis or state content exam study with free online learning resources. These resources are aimed at learners planning to teach grades 9–12; some are not recommended for middle grades or elementary science teacher candidates. Passing high-stakes standardized tests is a team effort—you are not alone!

## What are the topics covered in this guide?

- [FAQs: What to expect from any science Praxis or state content exam](#)
- Discipline-specific content
  - [Biology \(Life Sciences\)](#)
  - [Chemistry \(Physical Sciences\)](#)
  - [Physics \(Physical Sciences\)](#)
  - [Earth and Space Sciences](#)
- Content common to all exams regardless of discipline:
  - [Concepts in Science](#)
  - [Science Inquiry and Society](#) (includes engineering and technology)

## FAQs: What to expect from any science Praxis or state content exam

### When should I take this exam?

Give yourself at least four weeks of serious study before registering for the exam.

### Where can I take the exam?

You may take your Praxis or state content exam either at a testing center or at home with ProctorU. You are encouraged to take the exam at a testing center if at all possible. If you choose to use ProctorU, you will need a webcam. Check exam sites for updated access and cost information. If you go to a testing center, then follow the [ETS Testing Center Guidelines](#). Please **test your system BEFORE exam day** using these [ETS Equipment Requirements](#) before you register to take your exam at home.

### What COVID (or other disease) protocols should I be aware of?

Please check with your local testing center before test day. If you are taking the exam at home, there may still be specific criteria to follow from the exam provider. At a testing center, you may need to [bring your own mask](#) and follow the [ETS Testing Center Guidelines](#). These directives will be similar for any state content exam.

### Are there additional study guides?

Each Science Praxis exam has a study guide or study companion provided by the publisher or state at no cost. If you need help locating the appropriate site for exam study materials, please contact instructors in your specific discipline.

### Can I use any calculator?

You will **not** be allowed a calculator for any science Praxis exam.

### Can I use formula sheets?

There will be no physics or chemistry formula sheets for Praxis exams, but you will be provided a very plain onscreen [periodic table](#) and a [table of information](#).



### May I use anything else to help me?

You may use scratch paper at a testing center or a whiteboard at home. Be prepared to show both sides of the whiteboard to the proctor to show it is clean; if the whiteboard is bolted to the wall, show that it cannot be removed. In a testing center, you may use only those materials provided to you or approved by the proctor, such as pencils or whiteboard pens and erasers. Otherwise, your work area must be completely clean.

### What question formats are on the exam? Multiple choice, short answer, essay, etc.?

Each exam is composed mostly of multiple-choice test items. Most questions will be standard: select one answer from four options. Some test items will have multiple correct answers. You may also encounter at least one “drag and drop” test item where you are asked to move answer options to various parts of the screen.

While science Praxis exams do not contain short answer or essay items, some state content exams do. For example, California’s CSET exams are famous for challenging essay items on a variety of topics in multiple science disciplines.

### Is there partial credit for answers that have multiple correct answers?

About 10% of each exam may involve multiple-choice items where you select more than one answer option. All responses must be correct or the entire test item will be marked wrong. There is no partial credit.

### Where can I get information about accommodations?

If you need accommodation for medical or language concerns, please refer to the exam site for further guidance. Testing center locations or dates may be limited, and, in some cases, it can take up to six months or longer to arrange for accommodations. Praxis exams provide few alternate arrangements other than additional time. See the [ETS Disabilities Accommodations](#) or [ETS English Language Accommodations](#) pages.

### Is there a waiting period between attempts?

There is usually a mandatory waiting period between attempts of the Praxis. Check exam sites for more specific information.

## Discipline-Specific Content: Biology (Life Sciences)

### Get organized: What do you know and need to know?

The [ETS Study Companion for the Biology: Content Knowledge \(5235\)](#) Praxis exam includes very helpful information about the exam and preparation. We recommend reviewing these topics and identifying areas requiring further study.

- Page 5 describes the overall test, such as number of questions and time allowed. No calculator is permitted for the Praxis but may be allowed on a state content exam. You may have access to an online [periodic table](#) and [table of information](#).
- Pages 6–11 provide a detailed breakdown of content with each topic, which include:
  - Nature of Science: Scientific Inquiry, Methodology, Techniques, and History (15%)
  - Molecular and Cellular Biology (20%)
  - Genetics and Evolution (20%)
  - Diversity of Life and Organismal Biology (20%)
  - Ecology: Organisms and Environments (15%)
  - Science, Technology, and Social Perspectives (10%)

### Review major historical figures: Who did what when?

As you work through these materials, make note of the major historical figures who have contributed to science. There is no set list, so limit yourself to the 10 most famous people in your field.

- Make a timeline from 1500 to 2000 CE. Add scientists to this timeline as you encounter them. Indicate when they worked and what they did. For example: *Marie Curie—early 1900s—researched radioactivity.*
- You may also look at this [list of famous biologists](#).

### Use key resources: How can you fill key knowledge gaps?

Once you determine concept areas requiring review, here are some recommended resources:

#### Videos:

- [Amoeba Sisters – Biology](#)
  - [Amoeba Sisters Handouts](#)
- [Bozeman Science – Biology](#)
- [Crash Course – Ecology](#)
- [Khan Academy – Biology](#)
- [OpenStax Biology](#)

### Pay attention to other exam content: Have you reviewed the basic principles of science?

- [Concepts in Science](#)
- [Science Inquiry and Society](#) (includes engineering and technology)

### Work through practice questions: Did you master the concepts?

Content knowledge is not enough! You need to practice solving sample test items. Consider your test-taking strategy while you work through sample questions from reliable sources.

- Start with the [ETS Biology Study Companion](#): take the sample test on page 17.
- ETS offers two full-length practice exams available to purchase on the [Biology Praxis page](#).

## Discipline-Specific Content: Chemistry (Physical Sciences)

### Get organized: What do you know and need to know?

The [Study Companion for the Chemistry: Content Knowledge \(5245\)](#) Praxis exam includes very helpful information about the exam and preparation. We recommend reviewing these topics and identifying areas requiring further study.

- Page 5 describes the overall test, such as number of questions and time allowed. No calculator is permitted for the Praxis but may be allowed on a state content exam. You will have access to an online [periodic table](#) and [table of information](#).
- Pages 6–10 provide a detailed breakdown of content with each topic, which include:
  - Basic Principles of Matter and Energy; Thermodynamics (15%)
  - Atomic and Nuclear Structure (10%)
  - Nomenclature; Chemical Composition; Bonding and Structure (15%)
  - Chemical Reactions; Periodicity (20%)
  - Solutions and Solubility; Acid-Base Chemistry (15%)
  - Scientific Inquiry and Social Perspectives of Science (13%)
  - Scientific Procedures and Techniques (12%)

### Review major historical figures: Who did what when?

As you work through these materials, make note of the major historical figures who have contributed to science. There is no set list, so limit yourself to the 10 most famous people in your field.

- Make a timeline from 1500 to 2000 CE. Add scientists to this timeline as you encounter them. Indicate when they worked and what they did. For example: Marie Curie—early 1900s—researched radioactivity.
- You may also look at this [list of famous chemists](#).

### Use key resources: How can you fill key knowledge gaps?

Once you determine concept areas requiring review, here are some recommended resources:

#### Videos:

- [Penguin Prof](#) – Start with *Chemistry Basics Part I + Chemistry Basics Part II*
- [Tyler DeWitt Chemistry YouTube Channel](#)
- [Melissa Maribel Chemistry YouTube Channel](#)
- [Bozeman Science – Chemistry](#)
- [Khan Academy – Chemistry](#)

## Periodic Tables:

- [Interactive online](#)
  - [Electron configurations](#)
- [Plain](#)
  - [Other styles](#)

## Pay attention to other exam content: Have you reviewed the basic principles of science?

- [Concepts in Science](#)
- [Science Inquiry and Society](#) (includes engineering and technology)

## Work through practice questions: Did you master the concepts?

Content knowledge is not enough! You need to practice solving sample test items. Consider your test-taking strategy while you work through sample questions from reliable sources.

- Start with the [ETS Chemistry Study Companion](#): take the sample test on page 15.
- ETS offers two full-length practice exams available to purchase on the [Chemistry Praxis site](#).

## Discipline-Specific Content: Physics (Physical Sciences)

### Get organized: What do you know and need to know?

The [ETS Study Companion for the Physics: Content Knowledge \(5265\)](#) Praxis exam includes very helpful information about the exam and preparation. We recommend reviewing these topics and identifying areas requiring further study.

- Page 5 describes the overall test, such as number of questions and time allowed. No calculator is permitted for the Praxis but may be allowed on a state content exam. You may have access to an online [periodic table](#) and [table of information](#).
- Pages 6–10 provide a detailed breakdown of content with each topic, which include:
  - Mechanics (30%)
  - Electricity and Magnetism (20%)
  - Optics and Waves (13%)
  - Heat, Energy, and Thermodynamics (12%)
  - Modern Physics and Atomic and Nuclear Structure (13%)
  - Scientific Inquiry, Processes, and Social Perspectives (12%)
- Physics Praxis and state content exams are not calculus-based!
  - Be prepared to do some algebra by hand or to set up a strategy using specific formulae, but you will not be expected to fully solve complex math problems without a calculator.

### Review major historical figures: Who did what when?

As you work through these materials, make note of the major historical figures who have contributed to science. There is no set list, so limit yourself to the 10 most famous people in your field.

- Make a timeline from 1500 to 2000 CE. Add scientists to this timeline as you encounter them. Indicate when they worked and what they did. For example: *Marie Curie—early 1900s—researched radioactivity.*
- You may also look at this [list of famous physicists](#).

### Use key resources: How can you fill key knowledge gaps?

Once you determine concept areas requiring review, here are some recommended resources:

## Tutorials:

- [Physics Classroom](#): [Tutorials for learning](#), [interactives for simulations](#), [video tutorials](#), and [practice questions](#).
- [Hyper Physics](#) Concept's page: great for quick review of concepts, definitions, and equations.
- [Sparks Notes Physics review](#): Reference information for most topics on the exam.

## Videos:

- [Khan Academy – Physics](#)
- [Bozeman Science – Physics](#)

- [PBS Crash Course in Physics](#)
  - Includes content on quantum mechanics that may be on some state content exams but are not on the Praxis exam or fully covered in WGU courses.

### Pay attention to other exam content: Have you reviewed the basic principles of science?

- [Concepts in Science](#)
- [Science Inquiry and Society](#) (common to all exams regardless of discipline; includes engineering and technology)

### Work through practice questions: Did you master the concepts?

Content knowledge is not enough! You need to practice solving sample test items. Consider your test-taking strategy while you work through sample questions from reliable sources.

- Start with the [ETS Physics Study Companion](#): take the sample test on page 15.
- ETS offers one full-length practice exam available to purchase on the [Physics Praxis site](#).

Students find overlap in preparation for the Praxis exam with the AP Physics exam. Here are links to the study guides for the AP Physics I and AP Physics II test prep. Each course includes relevant review materials, practice questions, and equation sheets.

- [A Plus AP Physics Practice](#)
- [Giancoli AP Physics Practice](#)
- [College Board – AP Physics I](#)
- [College Board– AP Physics I – Booklet](#)
  - Review materials begin on page 33. Sample test questions on page 208, answer key found on page 221. Equation sheet found on page 244; these will NOT be provided on the Praxis.
- [College Board – AP Physics II](#)
  - Review materials begin on page 36. Sample test questions on page 225, answer key found on page 233. Equation sheet found on pages 244–245; these will NOT be provided on the Praxis.
- [OpenStax Physics](#)

## Discipline-Specific Content: Earth and Space Sciences

### Get organized: What do you know and need to know?

The [ETS Study Companion for the Earth Sciences: Content Knowledge \(5571\)](#) Praxis exam includes very helpful information about the exam and preparation. We recommend reviewing these topics and identifying areas requiring further study.

- Page 5 describes the overall test, such as number of questions and time allowed. No calculator is permitted for the Praxis but may be allowed on a state content exam. You will have access to an online [periodic table](#) and [table of information](#).
- Pages 6–10 provide a detailed breakdown of content with each topic, which include:
  - Basic Principles and Processes (10%)
  - Tectonics and Internal Earth Processes (15%)
  - Earth Materials and Surface Processes (25%)
  - History of Earth and its Life-forms (15%)
  - Earth's Atmosphere and Hydrosphere (20%)
  - Astronomy (15%)

### Review major historical figures: Who did what when?

As you work through these materials, make note of the major historical figures who have contributed to science.

- Make a timeline from 1500 to 2000 CE. Add scientists to this timeline as you encounter them. Indicate when they worked and what they did. For example: *Marie Curie—early 1900s—researched radioactivity.*
  - Famous Earth scientists are Nicholas Steno, James Hutton, Charles Lyell, Charles Darwin, Alfred Wegener, Harry Hess, and Inge Lehman.
- You may also look at this [list of famous astronomers](#) for Nicolas Copernicus, Tycho Brahe, Johannes Kepler, Galileo Galilei, Isaac Newton, Albert Einstein, and Stephen Hawking.



### Use key resources: How can you fill key knowledge gaps?

Once you determine concept areas requiring review, here are some recommended resources:

#### Textbooks:

- [Physical Geology](#)
- [Physical Geography](#)
- [Geology.com](#)
- [Earth and Space Science](#)

#### Videos—Specific subjects:

- [Mike Sammartano – Geology](#)
- [PBS – Surface Processes](#)
- [NWS – Meteorology](#)
- [Crash Course - Ecology](#)

#### Videos—Earth Sciences:

- [Khan Academy – Earth Sciences](#)
- [Bozeman Science – Earth Sciences](#)
- [Vision Learning – Earth Sciences](#)

#### Videos—Astronomy:

- [Crash Course – Astronomy](#)
- [Khan Academy – Astronomy](#)

### Pay attention to other exam content: Have you reviewed the basic principles of science?

- [Concepts in Science](#)
- [Science Inquiry and Society](#) (includes engineering and technology)

### Work through practice questions: Did you master the concepts?

Content knowledge is not enough! You need to practice solving sample test items. Consider your test-taking strategy while you work through sample questions from reliable sources.

- Start with the [ETS Earth Sciences Study Companion](#): take the sample test on page 16.
- ETS offers one full-length practice exam available to purchase on the [Earth Sciences Praxis page](#).

## Content Common to All Exams: Concepts in Science

### What do you need to know about concepts in science content common to all exams?

Every Praxis exam or state content exam study guide provided by the test publisher calls this section something different. It's important to understand, though, that the content is all the same.

Here are some descriptions of the same domain:

- Basic Principles and Processes
- Scientific Procedures and Techniques
- Nature of Science: Scientific Inquiry, Methodology, Techniques, and History

If you have completed EdReady math training and/or Concepts in Science at WGU, then you already know this material. If not, then it is very straightforward and can be mastered quickly because you probably learned this content earlier in your academic career.

### Use key resources: How can you fill key knowledge gaps?

Once you determine concept areas requiring review, here are some recommended resources:

#### Videos—Math Basics:

- [Metric System – Vision Learning](#)
- [Metric System – Math Antics](#)
- [Units of Distance – Math Antics](#)
- [Scientific Notation – Tyler DeWitt](#)
- [Significant Figures – Tyler DeWitt](#)

#### Videos—Accuracy and Precision:

- [Accuracy and Precision – TED Ed](#)
- [Accuracy and Precision – Tyler DeWitt](#)
- [Sources of Error – James Budarz](#)
- [Uncertainty, Error, Confidence – Vision Learning](#)

#### Videos—Math in Science:

- [Math in Science – Vision Learning](#)
- [Data Analysis and Interpretation – Vision Learning](#)
- [Statistics and Graphing – Bozeman Science](#)

#### Videos—Lab Safety:

- [Storing Chemicals – Flinn Scientific](#)
- [Chemical Storage Area – Flinn Scientific](#)
- [Organizing Chemicals – Flinn Scientific](#)
- [Chemical Disposal – Flinn Scientific](#)
- [Glassware Safety – Flinn Scientific](#)
- [Ventilation and Fume Hoods – Flinn Scientific](#)

## Content Common to All Exams: Science Inquiry and Society

### What do you need to know about science inquiry and society content common to all exams?

Each Praxis exam or state content exam study guide provided by the test publisher calls this section something different. It's important to understand, though, that the content is all the same.

This section may also be called:

- Science, Technology, and Social Perspectives
- Scientific Inquiry and Social Perspectives of Science
- Scientific Inquiry, Processes, and Social Perspectives

If you have completed Science Technology and Society and Science Methods at WGU, then you already know this material. If not, then it is very straightforward and can be mastered quickly because you probably learned this content earlier in your academic career.

### Use key resources: How can you fill key knowledge gaps?

There is no one way to approach scientific inquiry; what you may have learned as “scientific method” is general guidance rather than a one-size-fits-all rule regardless of discipline.

#### Tutorials:

- [HHMI BioInteractive – How Science Works](#)
- [Vision Learning – Scientific Method](#)
- [Vision Learning – Process of Science](#)
- [Teach Engineering – Engineering Design Process](#)

#### Educational Standards:

- Since 2012, most states have revised their science education standards to align with [“A Framework for K–12 Science Education.”](#)
- Be prepared to answer questions about the following:
  - [Nature of science](#)
  - [Crosscutting relationships among disciplines](#)
  - [Science and engineering practices in the classroom](#)
  - The role of [science, engineering, and technology in society](#).