

## What Every Teacher Should Know About TASC Science

This is an introduction to the science content on the TASC exam, based on analysis of public documents provided by the publisher, sample items, and the readiness exams. In this document, you will also find recommendations for teaching materials and other resources.

### The Basics

Testing time: 75 minutes

Number of questions: 48 (Computer-based) or 50 (Paper-based) Multiple-Choice Items

### Breakdown of Science Content

The TASC Blueprint offers a quick overview of the breakdown of the science content.

- Earth and Space Science (25%)
- Life Sciences (50%)
- Physical Sciences (25%)

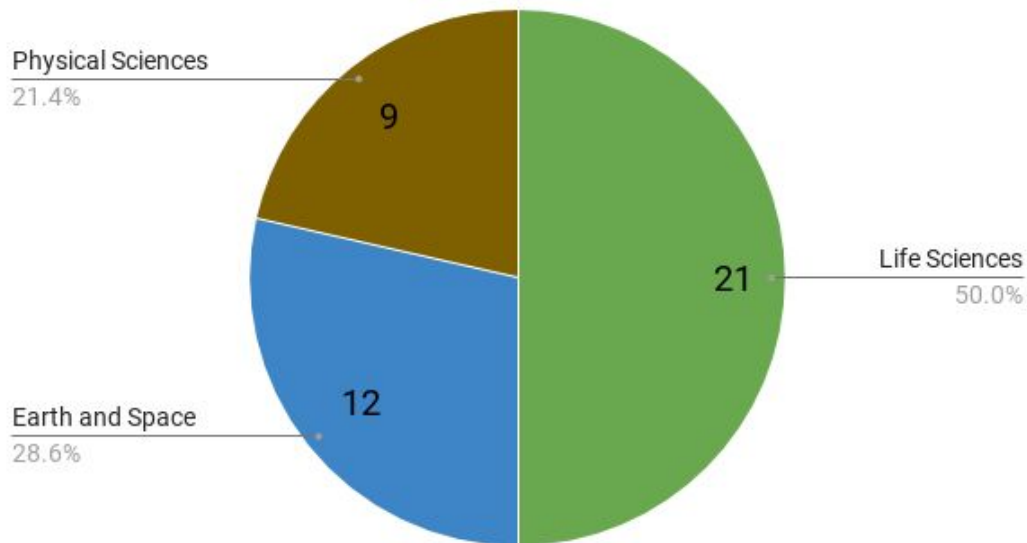
The three domains in science are further broken down into subdomains you can see in the chart below. Teachers can find teaching materials on [CollectEdNY.org's Framework Posts](http://CollectEdNY.org's Framework Posts) organized in these domains and subdomains.

Domain	Subdomain	Subdomain %	Domain %
Earth and Space Sciences	<a href="#">Earth's Place in the Universe</a>	10%	25%
	<a href="#">Earth's Systems</a>	10%	
	<a href="#">Earth and Human Activity</a>	5%	
Life Sciences	<a href="#">From Molecules to Organisms: Structures and Processes</a>	15%	50%
	<a href="#">Ecosystems: Interactions, Energy, and Dynamics</a>	15%	
	<a href="#">Heredity: Inheritance and Variation of Traits</a>	12%	
	<a href="#">Biological Evolution: Unity and Diversity</a>	8%	
Physical Sciences	<a href="#">Matter and Its Interactions</a>	7%	25%
	<a href="#">Motion and Stability: Forces and Interactions</a>	7%	
	<a href="#">Energy</a>	6%	
	Waves and Their Applications in Technologies for Information Transfer	5%	

## Analysis of TASC Readiness Assessment, Forms 4 & 5 (GHI) and 6 & 7 (JKL)

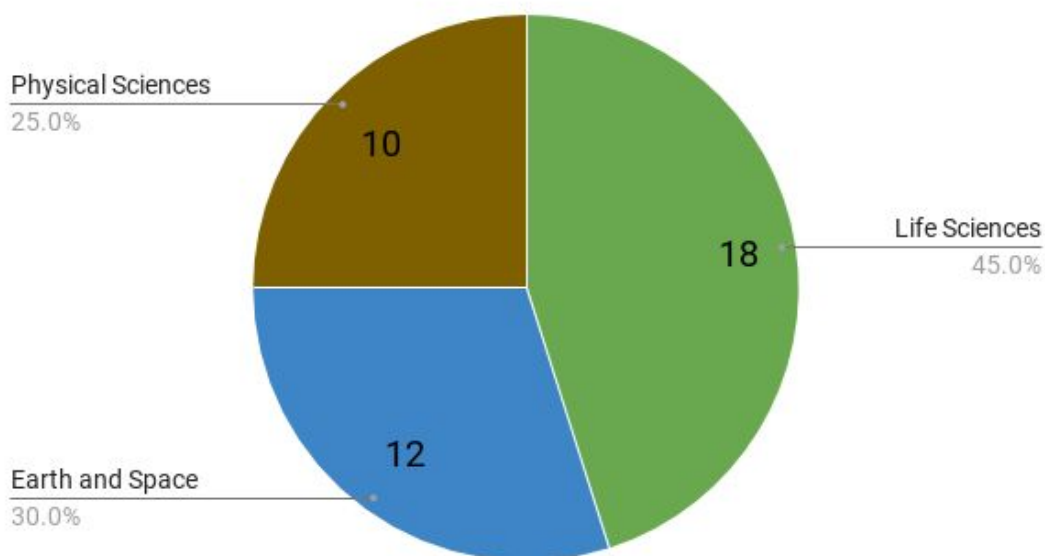
Looking through the questions on forms 4 and 5 shows the following breakdown, which roughly correlates to the percentages assigned to the domains in the GHI forms.

### Domain Breakdown for the Readiness 4/5



Analysis of 6 and 7 shows a small difference with the expected percentages: Life Sciences (50%), Earth & Space Science (25%), Physical Sciences (25%). However, this should be taken with a grain of salt, since some questions can count for multiple standards. For example, photosynthesis is an important life science topic, but understanding the molecules involved in photosynthesis requires chemistry, part of physical science.

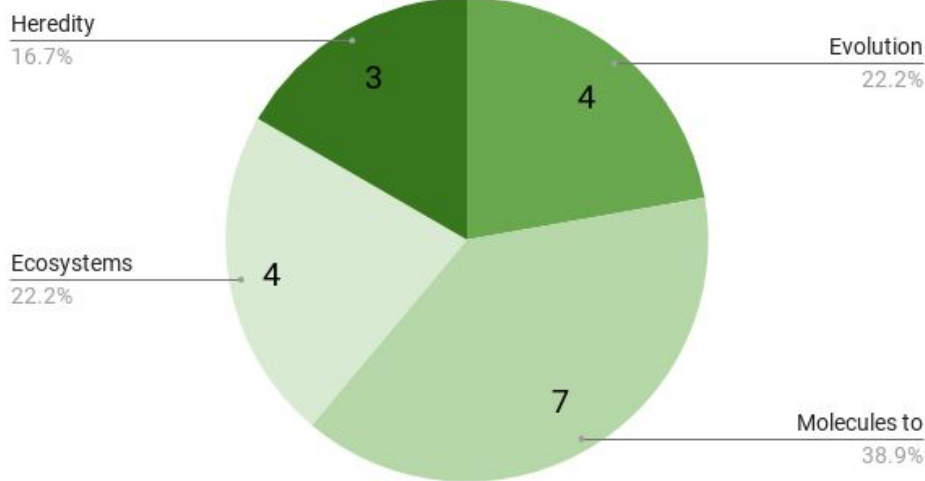
### Domain Breakdown for the Readiness 6/7



## Subdomains on the Science Test

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### Life Sciences: 50%



Topics covered:

**Molecules to Organisms** - photosynthesis, cellular respiration, cell theory, cellular division, DNA, genes, chromosomes

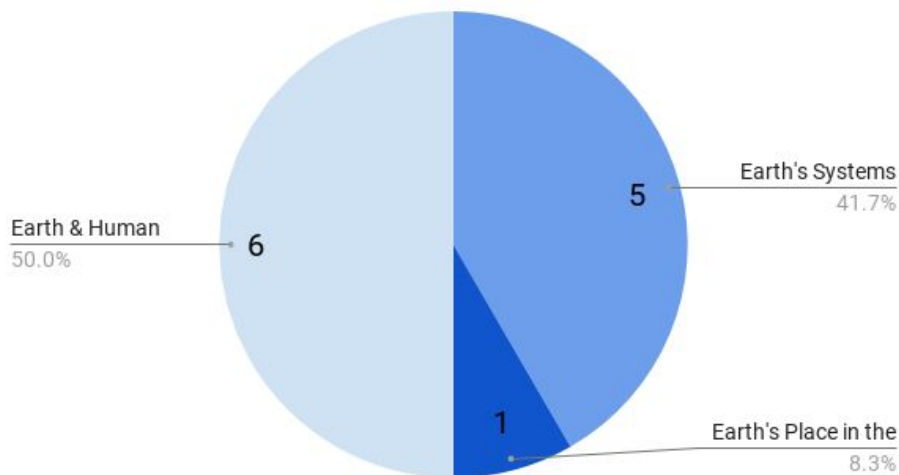
**Evolution** - evidence of common ancestry, natural selection, adaptation

**Ecosystems** - biodiversity, genetic diversity, carbon cycle, human impact, group behavior

**Heredity** - recessive & dominant traits, Punnett squares

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### Earth and Space Sciences: 25%



Topics covered:

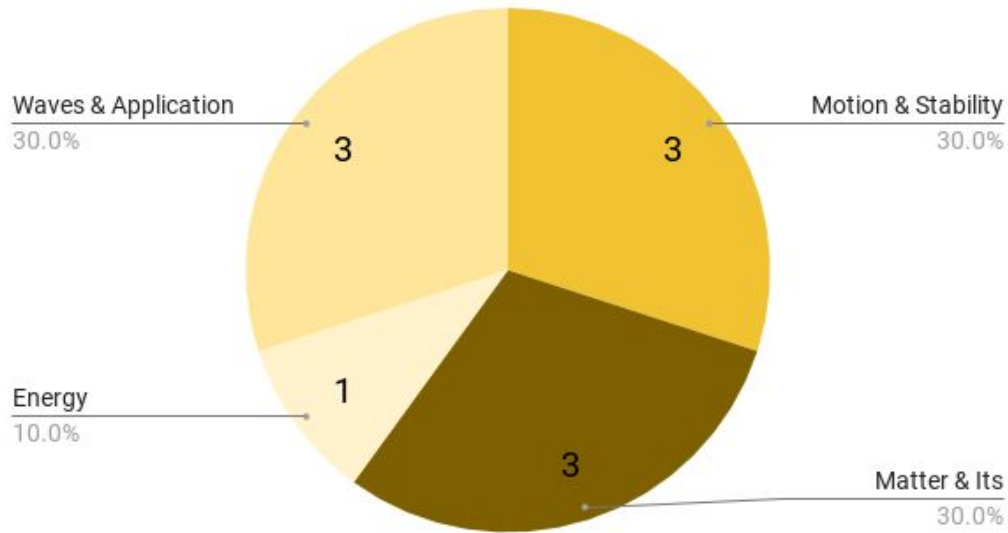
**Earth and Human Activity** - climate change, global warming, fossil fuels, alternative energy

**Earth's Systems** - weather, tectonic plates, continental movement, earthquakes, ocean currents, carbon cycle, water cycle

**Earth's Place in the Universe** - 4.5 billion years, Big Bang, motion and rotation of planets

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## Physical Sciences: 25%



Topics covered:

**Motion and Stability** - positive & negative charge, magnetism, gravity, force=mass x acceleration

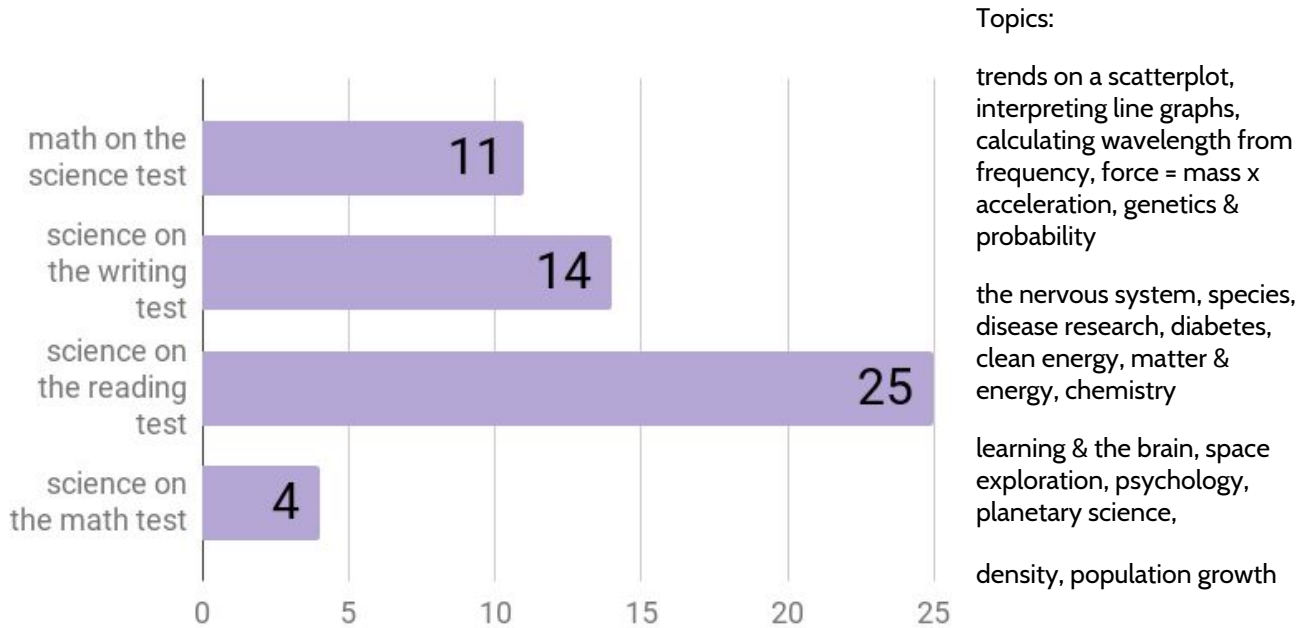
**Matter and Its Interactions** - structure of an atom, elements, states of matter, periodic table, bonding, chemical reactions

**Waves and Applications to Digital Technology** - benefits/challenges of digital storage of information, frequency and wavelength

**Energy** - explanation for water holding Earth's energy, electricity

## Connections between Different Subjects

The current version of the TASC exam emphasizes understandings across subject areas. Science content shows up throughout the test. For example, many of the texts used on the reading test have a science content focus. There is math on the science test and science on the math test.



## Math on the Science Test

There is some math on the science subtest. Students should expect at least one problem on the test that requires calculation and others that require them to interpret data. The math-related items on recent readiness tests required the following skills:

### Graph-reading:

- interpreting trends on scatterplots & line graphs

### Using formulas:

- calculating probability of genetics inheritance
- using the relationship,  $\text{force} = \text{mass} \times \text{acceleration}$ , to calculate force based on a table of data or on a situation in which the mass of the object changes
- calculating wavelength from frequency using the formula,  $\text{wave speed} = \text{frequency} \times \text{wavelength}$

Students can use a calculator for the science subtest. The calculator used for the test is the same as the math test, the Texas Instruments' TI-30XS. The things that students will actually have to do with the TI-30XS on the TASC are limited compared to all of the buttons and capabilities it has. We created this [calculator guide for students](#) to help focus on the skills they will need.

## Question Stems from the TASC Science Test

The following question stems were used on TASC readiness tests. You may want to work these questions into your materials, so that students become familiar with the ways of thinking that are assessed on the exam. As you can see, there is an emphasis on students' ability to understand cause and effects, predict patterns, explain phenomena, evaluate evidence, and interpret data.

*Which statement best represents...?*

*Which of these is an example of...?*

*Describe one way in which...*

*Which of these is a disadvantage of...?*

*How is the... related to the...?*

*Which of these is directly related to...?*

*What is the best explanation of...?*

*Which of these best explains...?*

*Which of these could explain the reason that...?*

*Why does the...?*

*Which best describes?*

*Which most likely describes?*

*Which conclusion can be drawn from these data?*

*What can be concluded from this observation?*

*Which conclusion is supported by this evidence?*

*Which of these statements about... is supported by this finding?*

*Which of these is the best interpretation of the data?*

*Which did the most to validate...?*

*Which explanation supports why... would...?*

*Which is most likely to...?*

*Which is not likely to...?*

*How might this affect...?*

*How has... affected...?*

*Which of these is the most likely cause of...?*

*Which should the scientist expect to occur if...?*

*Which pattern could be predicted...?*

*If the..., how would the... change?*

*Which process results in...?*

*Which result is most desirable in...?*

*Which solution would be most effective for...?*

## High-Impact Topics in Science

The following topics have appeared in multiple TASC readiness and sample test items. It seems that we can expect students will see many of these topics on the actual test. An explanation of each topic and sample questions can be found in the linked documents.

- [Photosynthesis and Respiration](#) (From Molecules to Organisms)
- [Natural Selection and Common Ancestry](#) (Biological Evolution: Unity and Diversity)
- [Population Growth](#) (Ecosystems)
- [Chromosomes, Genes, DNA](#) (Heredity)
- [Tectonic Plates](#) (Earth's Systems)
- [Climate Change](#) (Earth and Human Activity)

## Resources for Teaching TASC Science

The science section of the [CUNY HSE Curriculum Framework](#) provides an introduction to matter and basic chemistry with extensions to science/math connections. The Framework includes three complete inquiry-based model science lesson plans.

The [Detailed Descriptions and Sample Items for Life Science, Earth & Space Science, and Physical Science](#) on CollectEdNY.org describe in detail the standards assessed on the TASC and provide sample items for each standard. The goal of these documents is to describe the ideas that students need to understand so that teachers understand what they need to teach. The sample items can be used with students since have already been released to the public. Also noted is whether each standard is a high, medium or low emphasis topic on the TASC.

## References

This document is based on the following resources, many of which can be found at <http://www.tasctest.com/resources.html>.

- TASC Test JKL Objective Structure
- TASC Blueprint
- TASC Test and Item Specifications
- TASC Readiness Test 4, 5, 6, 7