



# Introduction to the Spring 2022 ISAT Science Assessments

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## Which grades are required to administer the spring 2022 ISAT Science summative assessments?

The Idaho State Board of Education approved a temporary rule to move the science assessment administered in middle school from grade 7 to grade 8 and to replace the high school end-of-course Biology and Chemistry assessments with a comprehensive science assessment administered in grade 11, beginning in spring 2020.

On October 16th, 2019 the Board of Education approved this final decision.

- Elementary ISAT Science: Grade 5
- Middle School ISAT Science: Grade 8 <sup>NEW</sup>
- High School ISAT Science: Grade 11 <sup>NEW</sup>

The [ISAT Science Assessment web page](#) on the SDE website has also been updated to reflect this decision.

The requirement to assess 95% of our students during the spring 2022 summative testing window is in effect.

## Do SY2021-2022's seniors that move into the district need to take the High School ISAT Science if they did not take an old end-of-course Biology or Chemistry ISAT Science test?

No.

The Board of Education approved the replacement of the high school end-of-course Biology and Chemistry assessments with a comprehensive science assessment that will be administered at grade 11.

The requirement to assess 95% of our students during the spring 2022 testing window is in effect.

## Do SY2021-2022's eighth graders and juniors need to take the Middle School and High School ISAT Science tests, respectively?

Yes.

SY2021-2022's eighth graders will be required to take the Middle School ISAT Science test.

SY2021-2022's juniors will be required to take the High School ISAT Science test.

## What are the testing dates for the ISAT Science assessments?

**Table 1: Interim Testing Window**

<b>ISAT Science <u>Interim</u> Grade Bands</b>	<b>Testing Window Opens</b>	<b>Testing Window Closes</b>
Elementary, Middle School, and High School	Monday, August 10, 2021	Friday, February 25, 2022

**Table 2: Summative Testing Window**

<b>ISAT Science Spring 2021 <u>Summative</u> Testing Grades</b>	<b>Testing Window Opens</b>	<b>Testing Window Closes</b>
Grades 5, 8, and 11	Monday, March 14, 2022	Friday, May 13, 2022

## What do the ISAT Science blueprints tell us?

Overall, test blueprints summarize the hierarchy of levels within published standards, and the number and types of questions aligned to those standards, that could appear on a specific assessment.

There are two types of blueprints published:

- Interim Assessment Blueprints ([Elementary](#), [Middle School](#), [High School](#))
- Summative Assessment Blueprints ([Elementary](#), [Middle School](#), [High School](#))

Elementary school interim and summative assessments include clusters and standalones aligned to grade 3, 4, and 5 Idaho State Science Standards (ISSS). The middle and high school interim and summative assessments include clusters and standalones aligned to those grade banded ISSSs, respectively.

## Interim Assessment Blueprints

For the SY2021-2022, there are

- fourteen (14) elementary school interims,
- nineteen (19) middle school interims,
- twenty (20) high school interims.

Within the grade bands, all of the content areas (Earth and Space Sciences, Life Science, and Physical Science (Chemistry & Physics at high school)) are represented.

Each interim test is comprised of one cluster that is aligned to one ISSS. The ISSS are three-dimensional (science and engineering practice, crosscutting concept, and disciplinary core idea), and each of the dimensions are identified in the interim blueprints.

Figure 1. shows a portion of the elementary interim blueprint.

**Figure 1: SY2021-2022 Elementary Interim Blueprint**

SY2021-2022 Science Interims		Elementary Science					Page 1 of 3
Number	Interims Science Tests	Assessment Grade	Grade Band	Science and Engineering Practice	Science Domain	Crosscutting Concept	Idaho State Science Standard
A	B	C		D	E	F	
1	Gr5 Earth and Space Science - Earth's Systems 1	5	Elementary (3-5)	Planning and Carrying Out Investigations	Earth and Space Science	Cause and Effect	ESS2-4-1
2	Gr5 Earth and Space Science - Earth's Systems 2	5	Elementary (3-5)	Using Mathematics and Computational Thinking	Earth and Space Science	Scale, Proportion and Quantity	ESS2-5-2

**Table 3: Figure 1 Key**

A	Each of the interims have been numbered in the blueprint. This numbering can be used for tracking purposes. The number does <b>not</b> indicate the intended order of interim test administrations.
B	The name of the interim as it appears in the Test Administration (TA) application and the Assessment Viewing Application (AVA).
C	Specific grade that should be chosen from the drop down in the Assessment Viewing Application (AVA) to access the interims. The grade band of the students that are encouraged to take the interim.
D	The first dimension of an ISSS. The Science and Engineering Practice describes the science task or activity the student will engage in while completing the interim test (cluster).
E	The second dimension of an ISSS, the Science Domain which includes (Earth and Space Science, Life Science, Physical Science)
F	The third dimension of an ISSS. The Crosscutting Concept describes the methods and thought processes in which scientists (and Idaho science students) will engage in to explain the natural world.

## Summative Assessment Blueprints

The SY2021-2022 ISAT Science test will be an operational field test. Students will receive a score or individual score report for this operational field test, after our summer 2022 standard setting meeting.

This is an operational field test, and the requirement to assess 95% of our students during the spring 2022 testing window is in effect.

The summative blueprints reflect the number of clusters and standalones a student could receive on his/her science assessment. Students could receive a cluster or standalone aligned to any of the ISSS.

Even though students could be administered a cluster or standalone aligned to any ISSS, there are specific parameters for the number of clusters and standalones a student will have on his/her test at the Science Domain level and thus total test length.

At elementary school:

- Physical Science: 2 clusters + 4 standalones
- Life Science: 2 clusters + 4 standalones
- Earth and Space Sciences: 2 clusters + 4 standalones
- *Plus 1 cluster or up to 4 standalones (field test)*
- **Total Summative: 7 clusters or up to 16 standalones.**

At middle school:

- Physical Science: 2 clusters + 4 standalones
- Life Science: 2 clusters + 4 standalones
- Earth and Space Sciences: 2 clusters + 4 standalones
- *Plus 1 cluster or up to 4 standalones (field test)*
- **Total Summative: 7 clusters or up to 16 standalones.**

At high school:

- Physical Sciences (Chemistry & Physics): 2 clusters + 5 standalones
- Life Science: 2 clusters + 4 standalones
- Earth and Space Sciences: 2 clusters + 4 standalones
- *Plus 1 cluster or up to 4 standalones (field test)*
- **Total Summative: 7 clusters or up to 17 standalones.**

## What is a cluster?

To determine a student’s mastery of the three-dimensional ISSSs, the ISAT Science assessment will include clusters.

Each cluster begins with a phenomenon (a discrete observation about the natural world), or an engineering/design problem. The cluster engages the student in a grade-appropriate, meaningful scientific activity that allows the student to demonstrate his/her ability to think like a scientist and explain the phenomenon or solve the engineering/design problem. A cluster task statement provides the student with a description of the overall purpose of the cluster. The associated interactions in the cluster align to at least two or three of the dimensions (SEP, DCI, CCC) of the aligned ISSS.

Figure 2. shows a model of a cluster.

Figure 2: Model of a Cluster

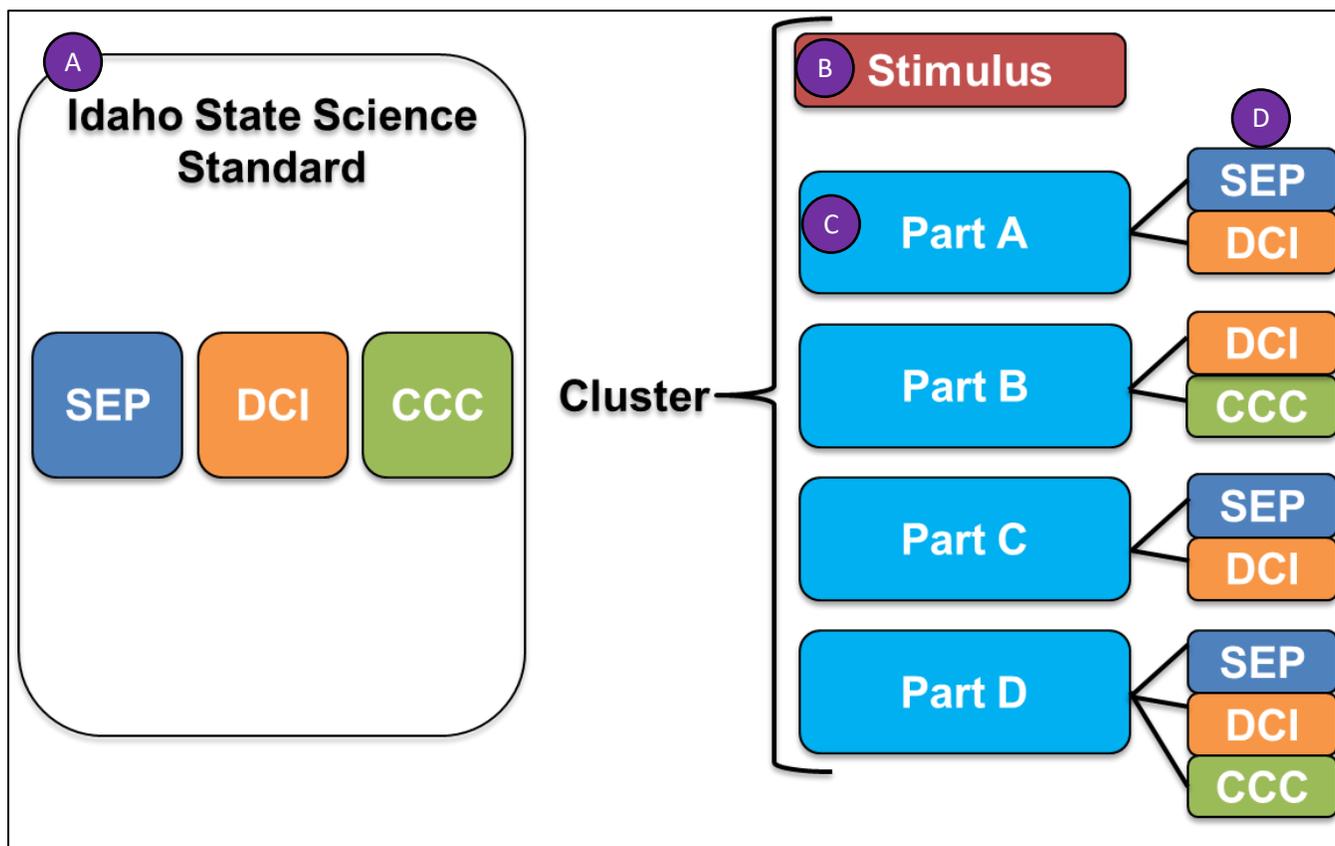


Table 4: Figure 2 Key

A	Each cluster is aligned to one ISSS. Each ISSS is three-dimensional, with a science and engineering practice, a disciplinary core idea (Science Domain), and a crosscutting concept.
B	The stimulus begins with the phenomenon or design/ engineering problem. The stimulus can also include, text, graphics, tabular or graphical data, and/or animations. The student will analyze this information when engaging with the associated interactions.
C	The associated interactions are given their own letter. In the cluster model shown in Figure 2, there are four associated interactions. This is just an example. Clusters can have greater or fewer associated interactions.
D	Each of the associated interactions will be aligned to two or three of the dimensions imbued within the aligned ISSS.

Figure 3 shows a middle school cluster that is aligned to LS2-MS-5 and appeared on the Science Sample Test.

Figure 3: Middle School Cluster

A

6

GUEST

C

Willow populations in Yellowstone National Park have increased since wolves were reintroduced to the park in 1995.

Willows are small trees that grow best in marshlike environments. After studying the Yellowstone food web shown in Diagram 1 and the population data for the park shown in Table 1, students arrive at two different hypotheses.

**Diagram 1. Yellowstone Food Web**

```

graph TD
    Aspen --> MuleDeer
    Aspen --> Beaver
    Aspen --> Elk
    Willow --> MuleDeer
    Willow --> Beaver
    Willow --> Elk
    MuleDeer --> Wolves
    Beaver --> Wolves
    Elk --> Wolves
            
```

**Table 2. Summary of Yellowstone Population Data and Supported Hypotheses**

Data	Hypothesis Supported
Elk population <input type="text"/>	<input type="text"/>
Beaver population <input type="text"/>	<input type="text"/>
Mule deer population <input type="text"/>	<input type="text"/>

**Part A**

Click on each box and select a word/phrase that completes the table with the Yellowstone population data from 1995 and 2004 and the hypothesis those data support.

**Table 1. Yellowstone Population Data**

	Wolves	Elk	Beaver	Mule Deer
1995	31	16,791	10	2,014
2004	171	8,335	120	2,014

Note: These data are approximate.

**Hypothesis 1:**  
When wolves were reintroduced to Yellowstone, the wolves preyed upon the elk, which allowed the beavers to eat more willow. This led to more beavers and beaver dams. Beaver dams create marsh environments that willows do well in, allowing the willow's population to increase.

**Hypothesis 2:**  
When wolves were reintroduced to Yellowstone, they preyed upon all animal species that ate plants. With fewer plant-eating animals eating willows, fewer willow plants were eaten and the population of willow plants increased.

**Your Task**

In the questions that follow, you will analyze and evaluate these two competing hypotheses.

**Part B**

Which hypothesis is best supported by the evidence?

- A All of the evidence is consistent with Hypothesis 1.
- B All of the evidence is consistent with Hypothesis 2.
- C Most of the evidence is consistent with Hypothesis 1.
- D Most of the evidence is consistent with Hypothesis 2.
- E The evidence does not favor either hypothesis.

**Part C**

Aspen trees are shown in Diagram 1. Moose and bison are two plant-eating animal species that are not shown in Diagram 1 but are also part of the Yellowstone food web.

Based on Hypothesis 2, click on each box to select a word/phrase to make a prediction about what would happen to the moose, bison, and aspen tree populations after the reintroduction of wolves.

**Table 3. Population Predictions**

Species	Population after Wolf Reintroduction	Reason for Impact on Population
Moose	<input type="text"/>	<input type="text"/>
Bison	<input type="text"/>	<input type="text"/>
Aspen tree	<input type="text"/>	<input type="text"/>

**Part D**

Based on Hypothesis 1, and the information in Diagram 1, Table 1, and Table 3 from part C, click on each box to select **two** different predictions.

**Table 4. Population Predictions**

Prediction Number	Prediction Statement
1	<input type="text"/>
2	<input type="text"/>

Table 5: Figure 3 Key

A	The stimulus begins with the phenomenon and includes text, graphics and tabular data.
B	The cluster task statement informs the student of the overall purpose of the cluster.
C	The associated interactions, are lettered A to D.

# What is a standalone?

In addition to clusters, the ISAT Science summative assessment will include standalones.

Each standalone begins with a phenomenon (a discrete observation about the natural world), or an engineering/design problem. The standalone engages the student in a brief, grade-appropriate, scientific activity that allows the student to demonstrate his/her ability to think like a scientist and explain the phenomenon or solve the engineering/design problem. The standalone is aligned to at least two or three of the dimensions (SEP, DCI, CCC) of the aligned ISSS.

Figure 4 shows a middle school standalone that is aligned to LS3-MS-1 and appears on the Science Sample Test.

Figure 4: Middle School Standalone

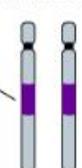
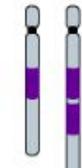
7☰

GUEST

Flies with bar-eyed phenotypes cannot see as well as those with wild type phenotypes.

The genotypes and phenotypes of three flies are shown in Figure 1.

**Figure 1. Genotypes and Phenotypes of Three Flies**

Genotype	Chromosomes	Phenotype
Wild type $B^1B^1$		Wild Type 
Heterozygous Bar $B^1B^2$		Bar-eyed 
Homozygous Bar $B^2B^2$		Bar-eyed 

Source: Scitable by nature EDUCATION

Click on each blank box to select the statements that complete the chain of events explaining how the bar-eyed mutation reduces a fly's eyesight.

**Chain of Events**

Step	Event
1	<input style="width: 100%;" type="text"/>
2	<input style="width: 100%;" type="text"/>
3	<input style="width: 100%;" type="text"/>
4	The eyesight of a fly is reduced.

## How much time will each cluster/standalone/ test take to complete?

Table 6 summarizes estimated time (in minutes) an elementary, middle school and high school student will take to answer a cluster, a standalone, all clusters, all standalones, the field test items, and the entire summative test.

**Table 6: Test Time Estimates**

	<b>Estimated Time on a Cluster (minutes)*</b>	<b>Estimated Time on a Standalone (minutes)</b>	<b>Estimated Time for All Clusters on Summative Test (minutes)</b>	<b>Estimated Time for All Standalones on Summative Test (minutes)</b>	<b>Estimated Time for Field Test (minutes)</b>	<b>Total Estimated Summative Test Time (minutes)</b>
<b>Elementary School</b>	9	2	54	24	10	88
<b>Middle School</b>	9	2	54	24	10	88
<b>High School</b>	10	2	60	26	10	96

\*Since each interim test is comprised of one cluster, this time estimate is also for each interim test.

## What will be reported from the spring 2022 summative assessment?

The SY2021-2022 ISAT Science test will be an operational field test. Students will receive a score and an individual score report for this operational field test, after our summer 2022 standard setting meeting.

The requirement to assess 95% of our students during the SY2021-2022 summative testing window is in effect.

## How can I access the Science Sample Test?

The Science Sample Test is available via the [Idaho Portal](#). A Guest User can login under a Guest Session and take the elementary, middle school or high school sample test as many times as necessary.

Answer Keys for the [Elementary](#), [Middle School](#), [High School](#) Science Sample Tests are available on the Idaho Portal.

As you are taking a Science Sample Test, you can check which scoring assertions you got correct. After answering at least one interaction in the cluster, click on the Content Text menu, and click Score Item. A pop-up box will appear that contains the scoring assertions and a green check or red X indicating which scoring assertions you got correct or incorrect, respectively.

Figure 5 shows the location of the Context Menu for the second cluster on the high school Science Sample Test.

**Figure 5: Context Menu to Score Item**

The screenshot displays a science sample test interface. On the left, there is a text block describing a reaction: "A piece of lithium is added to a beaker of water and it begins to fizz while a piece of sodium metal is added to another beaker of water and it gives off an orange flame and white smoke." Below this, it states: "Lithium and sodium are both alkali metals. Lithium metal, when combined with water, produces lithium hydroxide and hydrogen gas:" followed by "Figure 1. Reaction of Lithium and Water" and the chemical equation  $2 \text{Li}_{(s)} + 2 \text{H}_2\text{O}_{(l)} \rightarrow 2 \text{LiOH}_{(aq)} + \text{H}_{2(g)}$ . A "States of Matter Key" box lists: (aq) aqueous, (g) gas, (l) liquid, and (s) solid.

The main test area shows "Part A" with the instruction: "Based on your observations in Animation 1 and Animation 2, select all of the that can be identified in the reactions of lithium and sodium with water." Below this are five checkboxes: "flammability" (checked), "boiling point", "reactivity with water", "electrical conductivity", and "oxidation state".

A context menu is open in the top right corner, listing options: Tutorial, Mark for Review, Notepad, Score Item (highlighted), Highlight Selection, and Strikethrough. The interface also shows a user status of "GUEST" and a "Last Saved" time of "2:36 PM".

Figure 6 shows the pop-up box that contains the scoring assertions.

Figure 6: Scoring Assertion Pop-Up Box

A piece of lithium is added to a beaker of water and it begins to fizz while a piece of sodium metal is added to another beaker of water and it gives off an orange flame and white smoke.

Lithium and sodium are both alkali metals. Lithium metal, when combined with water, produces lithium hydroxide and hydrogen gas:

**Figure 1. Reaction of Lithium and Water**

$$2 \text{Li}_{(s)} + 2 \text{H}_2\text{O}_{(l)} \rightarrow 2 \text{LiOH}_{(aq)} + \text{H}_{2(g)}$$

**States of Matter Key**

- (aq) aqueous
- (g) gas
- (l) liquid
- (s) solid

Click on the small gray arrow to run the animation and see how lithium metal reacts when combined with water.

**Animation 1. Reaction of Lithium Metal**

Part A

**Scoring Results for Item #2**

Your response earned **1** point of a possible **13**

Achieved	Max	Score Rationale
		The student selected "flammability" and none of the incorrect answers. This indicates an ability to record observations made in the reactions of lithium and sodium as shown in the animation. ✓
		The student selected "reactivity with water" and none of the incorrect answers. This indicates an ability to record observations made in the reactions of lithium and sodium as shown in the animation. ✗
		The student selected "valence electrons," indicating understanding of the outer electron states of alkali metals. ✗

Close

Animation 2, select all of the properties of lithium and sodium with water.

phrase that **best** completes the

of [dropdown], which suggests

uggest that alkali metals

ined with water.

## How can I administer the science interims?

The science interims can be administered in a standardized or non-standardized method.

- [Test Administration \(TA\) application](#) = Standardized
- [Assessment Viewing Application \(AVA\)](#) = Non-Standardized
- [Remote Interim Testing Site](#) = Remote

### Test Administration (TA) Application

The TA application is available on the [Idaho Portal](#).

A standardized administration of an interim using the TA app, can provide an administration similar to that of the summative assessment. A test session is started and students can individually login to that test session using the Secure Browser or via the Remote Interim Testing Site.

An [Interim Assessment Implementation Planning Checklist](#) is available on the Idaho Portal. It provides the necessary and required steps to administer an interim assessment via the TA app.

Results from a SY2021-2022 science interim administered via the TA app are available via Reporting on the [Idaho Portal](#).

### Assessment Viewing Application (AVA)

AVA is available on the [Idaho Portal](#).

A non-standardized administration of an interim using AVA can provide educators an opportunity to conduct an individual, small group, or an entire classroom test-taking activity. Educators can display the interim to the class and have the students individually, or in small groups, or as an entire class work through an interim.

AVA also provides educators a platform to review an interim assessment prior to a standardized administration.

### Remote Interim Testing Site

Platform that remote learning students can use to log in and take an interim assessment

Allows remote learning students to use a web browser already installed on their machines (Chrome or Firefox) rather than the Idaho Secure Browser.

Remote learning student chooses their state (Idaho) from first drop down, and the "Idaho Assessment System" is shown in second drop down.

## Are there answer keys for the science interims?

Yes. Answer keys for the science interims are available in TIDE. Click on the General Resources tab and then click on Interim Tests Scoring Materials.

All interim test items and answer keys must be treated securely. Do not reproduce and/or distribute interim test items and/or answer keys.

## Document Version Control & Tracking

**Table 7: Version Control and Tracking**

<b>Version Number</b>	<b>Date</b>	<b>Updates</b>
1	11/4/2019	Document created.
2	11/5/2019	Hyperlinks added.
3	11/6/2019	Added Qs&As concerning seniors and last year's Gr7 & sophomores on p2.
4	09/25/2020	Updates for SY2020-2021
5	01/17/2022	Updates for SY2021-2022