Lesson 3.3
Evaluating Strength Test Evidence
Searching for Evidence in a Reference Book

Students look for evidence about possible glue ingredients in the *Handbook of Interesting Ingredients*.

### Instructional Guide

1. **Hold up the cover of the *Handbook of Interesting Ingredients***.

   ![Image](https://via.placeholder.com/150)

   You have gathered some evidence from observing ingredients and conducting strength tests. Now you will have the opportunity to look for evidence about ingredients in the *Handbook of Interesting Ingredients*.

2. **Project notebook page 54, Gathering Evidence from the *Handbook of Interesting Ingredients***. Have students open their notebooks and follow along as you read the directions and explain the activity. Remind them they have already collected some evidence from the Handbook about the stickiness of ingredients.

   ![Image](https://via.placeholder.com/150)

   Now you are going to record any evidence you can find about strength or about any other properties you think will make good glue.

3. **Model looking up one ingredient and recording evidence**.

   - Remind students about the index and table of contents and how they can use these text features to find the relevant pages for each ingredient.
   - Project the table of contents and look up *gelatin*.
   - Then turn to pages 20–21. Have students follow along in their books.
   - Read aloud the Cause and Effect section on page 21.
   - Explain that the fact that gelatin can hold ingredients together might make it useful in a strong glue mixture.

4. **Have student pairs begin looking up evidence**. Circulate as they work. Make sure that pairs are sharing in the task; help them use the features of the reference book as necessary.

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Teacher Support

Instructional Suggestion

Literacy Note: Using a Reference Book
Students have been introduced to the idea that reference books are not intended to be read cover to cover. Rather, people search for the information they need and then read the relevant sections carefully. In this lesson, responsibility for using the reference book is released to students; however, students may still require some guidance and assistance. You may need to remind students of the location and use of the table of contents and index, and it may be helpful to remind them which ingredients they should search for. Reading reference materials in this way is authentic to how scientists and engineers use reference materials, and it encourages students to read complex text both purposefully and carefully.

Instructional Suggestion

Providing More Experience: Connecting Energy and Matter to the *Handbook of Interesting Ingredients*
Energy and Matter is a crosscutting concept called out by the Next Generation Science Standards (NGSS). The *Handbook of Interesting Ingredients* offers an opportunity to extend student learning and engage with this crosscutting concept. Many of the ingredients listed in the text come from natural sources that must be broken down into smaller pieces to create the ingredients we are familiar with. These pieces are also often put back together in new ways to create larger objects as well. As students read about different types of ingredients and gather evidence about which ingredients will make a good glue, point out that each ingredient has a section entitled “Where It Comes From.” For example, invite students to turn to page 24 and read to find out where salt comes from. Encourage students to think about how familiar ingredients like table salt are made from their natural source (e.g., You have to grind up blocks of salt into little pieces). Let students know that the book describes many similar examples in which objects must be broken down into smaller pieces to create familiar ingredients. As a class, make a chart of ingredients that follow this pattern and ask students to explain where each ingredient comes from.

Possible Responses

**Investigation Notebook**

Gathering Evidence from *Handbook of Interesting Ingredients* (page 54)

Evidence that each ingredient will make a good glue

- **cornstarch**: used to stick crayon wrappers, stick when it starts to dry, sticky when mixed with hot water, no smell

- **gelatin**: makes a mixture gel, can hold ingredients in a mixture together

- **corn syrup**: can make a mixture sticky when dry
flour: sticky when mixed with water, mixture is hard when dry

(another ingredient):
egg white: can become sticky and hard when dried, has been used as a glue for years
## Gathering Evidence from the *Handbook of Interesting Ingredients*

**Directions:**
1. Look through the book and find evidence that each ingredient in the table will make a good glue.
2. Record the evidence in the table.
3. Choose another ingredient from the book.
4. Add it to the table and record evidence that it will make a good glue.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Evidence this ingredient will make a good glue</th>
</tr>
</thead>
<tbody>
<tr>
<td>cornstarch</td>
<td></td>
</tr>
<tr>
<td>gelatin</td>
<td></td>
</tr>
<tr>
<td>corn syrup</td>
<td></td>
</tr>
<tr>
<td>flour</td>
<td></td>
</tr>
<tr>
<td>(another ingredient)</td>
<td></td>
</tr>
</tbody>
</table>
Reunir evidencia del *Manual de ingredientes interesantes*

Instrucciones:
1. Repasa el libro y busca evidencia de que cada uno de los ingredientes en la tabla hará un buen pegamento.
2. Apunta la evidencia en la tabla.
3. Elige otro ingrediente del libro.
4. Agrégalo a la tabla y apunta evidencia de que hará un buen pegamento.

<table>
<thead>
<tr>
<th>Ingrediente</th>
<th>Evidencia de que este ingrediente hará un buen pegamento</th>
</tr>
</thead>
<tbody>
<tr>
<td>almidón de maíz</td>
<td></td>
</tr>
<tr>
<td>gelatina</td>
<td></td>
</tr>
<tr>
<td>jarabe de maíz</td>
<td></td>
</tr>
<tr>
<td>harina</td>
<td></td>
</tr>
<tr>
<td>(otro ingrediente)</td>
<td></td>
</tr>
</tbody>
</table>