

# Investigation 1-A

## SKILL FOCUS

Initiating and Planning

Performing and recording

Analyzing and interpreting

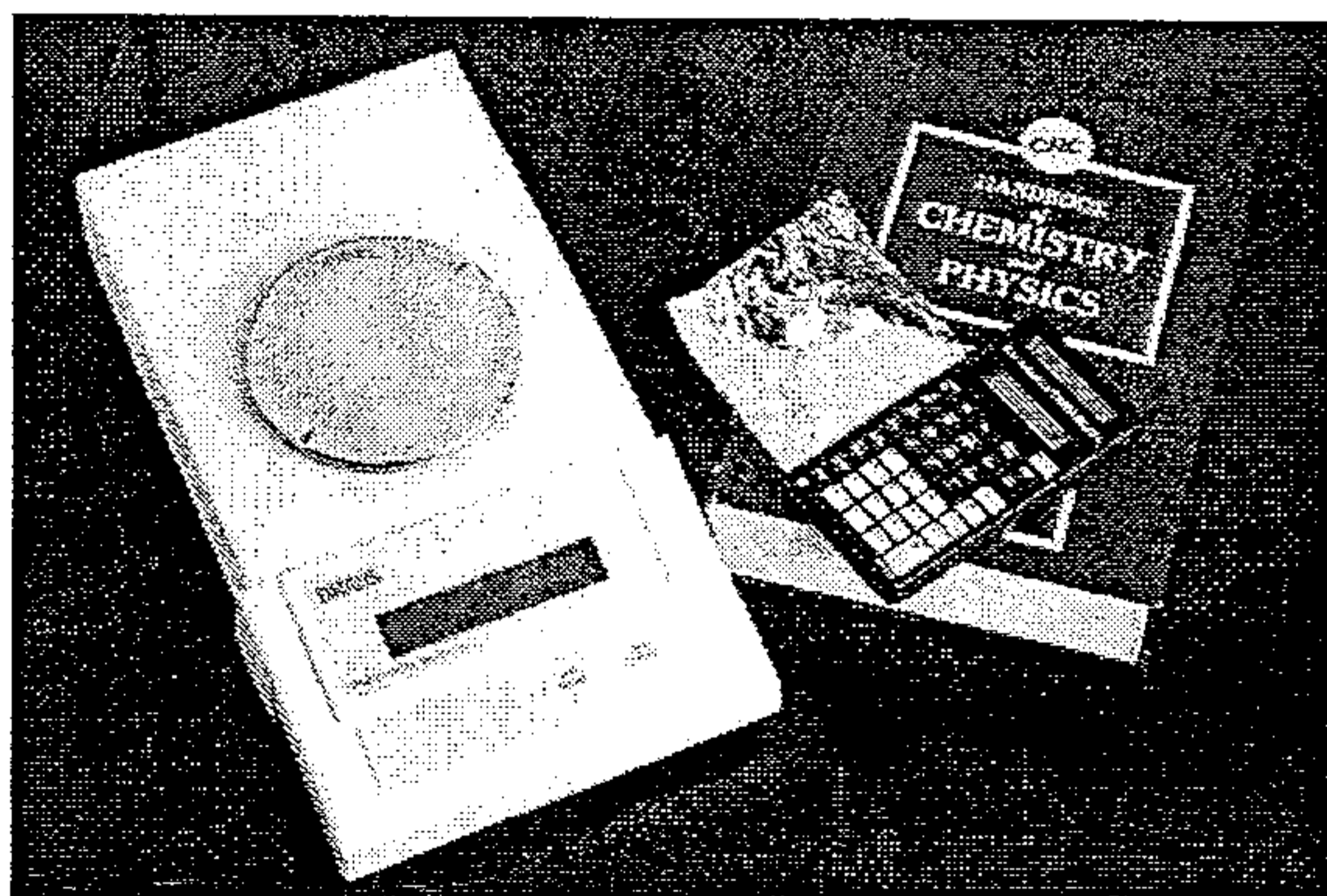
## Observing Aluminum Foil

You can easily determine the length and width of a piece of aluminum foil. You can use a ruler to measure these values directly. What about its thickness? In this investigation, you will design a method for calculating the thickness of aluminum foil.

### Problem

How can you determine the thickness of a piece of aluminum foil, in centimetres?

### Safety Precautions



### Materials

10 cm × 10 cm square of aluminum foil  
ruler  
electronic balance  
calculator  
chemical reference handbook

### Procedure

1. Work together in small groups. Brainstorm possible methods for calculating the thickness of aluminum foil.
2. Observe and record as many physical properties of aluminum foil as you can.  
**CAUTION** Do not use the property of taste. Never taste anything in a laboratory.

3. As a group, review the properties you have recorded. Reflect on the possible methods you brainstormed. Decide on one method, and try it. (If you are stuck, ask your teacher for a clue.)

### Analysis

1. Consider your value for the thickness of the aluminum foil. Is it reasonable? Why or why not?
2. Compare your value with the values obtained by other groups.
  - (a) In what ways are the values similar?
  - (b) In what ways are the values different?

### Conclusion

3.
  - (a) Explain how you decided on the method you used.
  - (b) How much confidence do you have in your method? Explain why you have this level of confidence.
  - (c) How much confidence do you have in the value you calculated? Give reasons to justify your answer.

### Applications

4. Pure aluminum has a chemical property in common with copper and iron. It reacts with oxygen in air to form a different substance with different properties. This substance is called aluminum oxide. Copper has the same chemical property. The substance that results when copper reacts with oxygen is called a patina. Similarly, iron reacts with oxygen to form rust. Do research to compare the properties and uses (if any) of aluminum oxide, copper patina, and rust. What technologies are available to prevent their formation? What technologies make use of their formation?



## LAB REPORT RUBRIC

Lab Title: Observing Aluminum Foil Due Date: \_\_\_\_\_

Name: \_\_\_\_\_ Group names: \_\_\_\_\_

Lab Report Section		✓	Level 1	Level 2	Level 3	Level 4	Format Errors
<b>Title Page</b> (present, correct, concise)		✓	0.0			1.0	
<b>Hypothesis</b> (present, correctness, wording)			0.5	1.0	1.5	2.0	
<b>Purpose</b> (present, correct)		✓	0.5	1.0	1.5	2.0	
<b>Theory &amp; Method</b> (present, correct)		✓	0.5	1.0	1.5	2.0	
<b>Materials &amp; Apparatus</b> (no extras, all present)		✓	0.5	1.0	1.5	2.0	
<b>Illustrations:</b> apparatus set-up (correct, labels, quality)			0.5	1.0	1.5	2.0	
<b>Procedure</b>	(referral, amendments)		0.5	1.0	1.5	2.0	
	full: person, tense, voice, correct, concise)	✓	1.0	2.0	3.0	4.0	
<b>Results</b>	per <b>table</b> selected	✓	0.5	1.0	1.5	2.0	
	per <b>graph</b> "		2.0	3.0	4.0	5.0	
	per <b>sample calc'n</b> (present, correct)	✓	0.5	1.0	1.5	2.0	
	(correct, concise, ident'n of relationships)		0.5	1.0	1.5	2.0	
<b>Error Analysis</b> (3 likely sources of error that occurred and their effects)			1.0	2.0	3.0	4.0	
<b>Conclusions</b> (assessment of introduction, how well do results support expectations of purpose and design)		✓	1.0	2.0	3.0	4.0	
<b>Recommendations</b> (improvements to design, ways to control and/or prevent errors mentioned)			0.5	1.0	1.5	2.0	
<b>General Format, Completeness, Neatness</b> (sig digs, spelling, grammar, tense, table borders, ruler, sentence structure etc.)							/10

Notes: 1) Only sections marked with a ✓ will be evaluated.

**Discussion Questions** (# and marks): \_\_\_\_\_ /

**Additional Requirements:**

**TOTAL:** /