Unit 9 (Systems):
If-Then Logic

Concept   We can analyze a chain of action.

Content   Students will create models that demonstrate a chain of 3 connected events.
Objective

Language   Students will use if/then statements to describe basic features of a chain of events
Objectives

Standards
- **NGSS**
  - **3-PS2-1.** Plan and investigate the effects of balanced and unbalanced forces on the motion of an object.
- **TEKS**
  - **1A** Demonstrates safe practices during classroom investigations.
  - **2A** Plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a specific problem in the natural world.
  - **3A** Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing.
  - **4A** Collect, record, and analyze information using tools.
  - **4B** Use safety equipment as appropriate, including safety goggles and gloves.

- **ELPS**
  - **4G** Demonstrate comprehension of increasingly complex English by participating in shared reading, retelling or summarizing material, responding to questions, and taking notes commensurate with content area and grade level needs.
  - **5B** Write using newly acquired basic vocabulary and content-based grade-level vocabulary.
  - **3D** Speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency [Application for Acquisition]

Tools	Models of the folders on **p. 24-28 in Teacher Handbook**
Materials	Posterboard, paper fasteners, tape, scissors, strips of cardboard or tongue depressors, glue, straws, toothpicks, index cards, stapler
	Handouts **3.9.1-3.9.4**
Literature Connections	any of the *There Was an Old Woman*…books and any of the *If You Give a Mouse a*… books

Day 1: Engage/Explore

Teacher Says/Does	Student Says/Does	Language requirements
1. Read with your class the folk song (or poem) in handout **3.9.1**, "There was an old woman who swallowed a fly…" 2. Ask the students to help you list the events that occurred, using the graphic organizer in handout **3.9.2**. 3. Display the folk song so all students can see it, and then have a discussion with students identifying what events in the chain could have been omitted without affecting the end result. 4. Discuss what the old woman must have been thinking by referring to the following phrases: a. "If I swallow a spider, then it will catch the fly. b. If I swallow a bird, then it will catch the spider…" and so on 5. Have them consider if the old woman would have swallowed a. a dog if she hadn't swallowed a fly. 6. Tell the children that a chain of events in a story is similar to the chain of events in the poem just discussed and also in a moving machine or in a computer. 7. Ask students to work in pairs and create a chain of events using the graphic organizer in handout **3.9.3**, or fill in the one that has a starting event and a final event. 8. Encourage them to reflect on their chain of events and use the sentence starters in handout **3.9.4** to write down ideas about their work.	Students use a folk song to get familiarized with the concept of a chain of events	• chain of events

Day 2: Explore/ Explain

Teacher Says/Does	Student Says/Does	Language requirements
1. Tell the children that today they will make a puzzle with a chain of events that only their team knows about and quiz the class on it. Discuss how a chain of events in a story is similar to the chain of events in a moving machine or in a computer. 2. Review chains of events that students have constructed, or discuss with the class the following example: • If your brother drinks the last of the milk tonight, there won't be milk for breakfast. • If there is no milk for breakfast, you will have to eat breakfast at school. • If you have to eat breakfast at school, you will need to get up earlier than usual. • If you will need to get up earlier than usual, you'd better reset your alarm clock. 3. Ask: How did your brother drinking milk make you re-set your alarm clock? 4. Ask the teams to think of a chain of events, real or fictional, and write (or draw) the first event (cause) and final event (effect) on the sides of the folder where everyone can see them. Then they write (or draw) the other events in the chain inside the folder. • Note: Some students may need to consider "short" event chains first; have them create several folders, getting more complex each time as possible.	Students compare the chain of events in a story with the chain of events in a moving machine or a computer Students create a chain of events	Chain of events

Day 3: Elaborate and Evaluate

Extensions into the disciplines	Practical Extensions	Language requirements

1. When teams are finished, they should present their puzzle folders to the class. When they do so, they should ask their classmates to guess what happens inside the folder!
 	
2. Ask the students:
   a. If you could do some "fixing," or "trouble-shooting" in your story chain of events, what might you fix to make the end result different?
   b. How does understanding the chain of events in a system help trouble-shoot when there are problems?
 	
3. Place the folders in a Design Gallery with titles, or accompany them with a paper chain in which each link has one story event that causes the next.		

There was an old woman who swallowed a fly, I don't know why she swallowed a fly, I guess she'll die; There was an old woman who swallowed a spider that wriggled and jiggled and tickled inside her; she swallowed the spider to catch the fly, but I don't know why she swallowed the fly, I guess she'll die; There was an old woman who swallowed a bird, how absurd! She swallowed a bird! She swallowed the bird to catch the spider that wriggled and jiggled and tickled inside her; she swallowed the spider to catch the fly, but I don't know why she swallowed the fly. I guess she'll die. There was an old woman who swallowed a cat.
Imagine that! She swallowed a cat! She swallowed the cat to catch the bird, she swallowed the bird to catch the spider that wriggled and jiggled and tickled inside her; she swallowed the spider to catch the fly, but I don't know why she swallowed the fly. I guess she'll die. There was an old woman who swallowed a dog. She went the whole hog! She swallowed a dog! She swallowed the dog to catch the cat, she swallowed the cat to catch the bird, she swallowed the bird to catch the spider that wriggled and jiggled and tickled inside her; she swallowed the spider to catch the fly, but I don't know why she swallowed the fly. I guess she'll die. There was an old woman who swallowed a cow. I don't know how she swallowed a cow! She swallowed the cow to catch the dog, she swallowed the dog to catch the cat, she swallowed the cat to catch the bird, she swallowed the bird to catch the spider that wriggled and jiggled and tickled inside her; she swallowed the spider to catch the fly, but I don't know why she swallowed the fly. I guess she'll die. There was an old woman who swallowed a horse. She died, of course.

There was an old woman who swallowed a fly

→

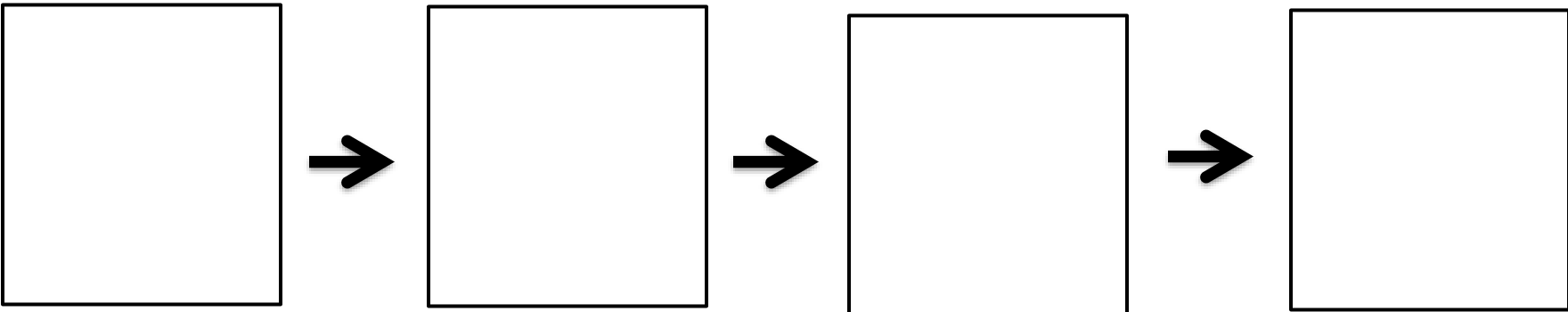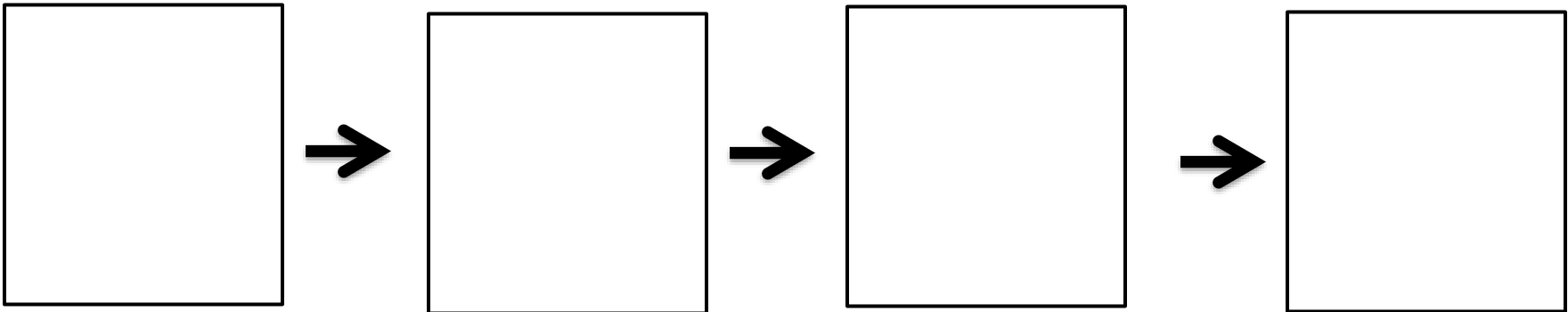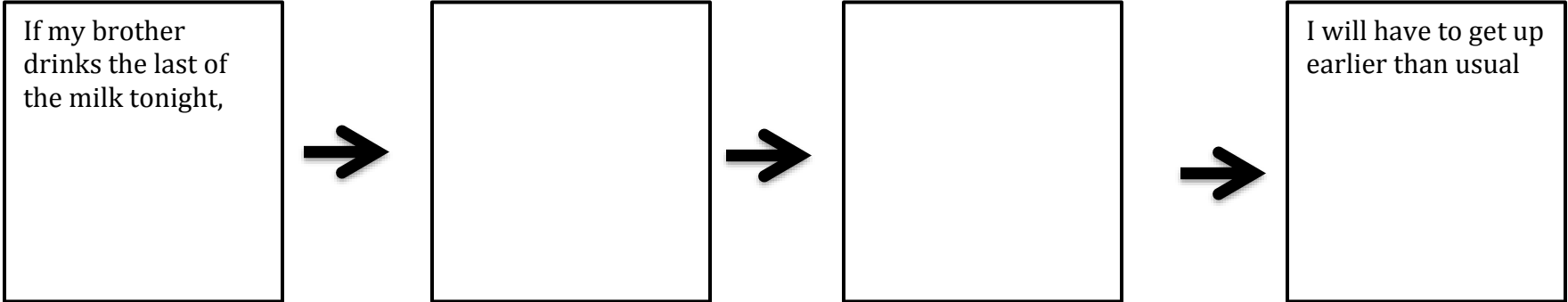She swallowed _____ to catch _____

→

She swallowed _____ to catch _____

She swallowed _____ to catch _____

→

She swallowed _____ to catch _____

→

She swallowed _____ to catch _____

If my brother drinks the last of the milk tonight,	→		→		→	I will have to get up earlier than usual
	→		→		→	
	→		→		→	

Our chain of events was about

_____

We chose it because

_____

The first event was_____

The last event was_____