

A Common Core State Standards &  
Next Generation Science Standards  
Aligned Educator's Guide for

# THE IRE OF IRON CLAW

BOOK 2 OF THE  
GADGETS AND GEARS SERIES



Grades: 4-7

ISBN: 9780544556843

WRITTEN BY KERSTEN HAMILTON

ILLUSTRATED BY JAMES HAMILTON

PUBLISHED BY CLARION BOOKS

**Synopsis:** *In this second book of an inventive series filled with cool scientific details, the loyal dachshund Noodles, the boy inventor Wally Kennewickett, and his scientific genius family and staff of automatons join forces with Nikola Tesla to defeat sky pirates, cross Europe in a giant mechanical spider, and defy evil magicians. The Wild, Wild West meets Tom Swift; perfect for fans of M.T. Anderson's Pals in Peril, Michael Buckley's NERDS, and Jon Scieszka's upcoming Frank Einstein series.*

Guide Created by Debbie Gonzales

Graphic Layout by Moriah Ellig



## TABLE OF CONTENTS

|  |    |
|--|----|
| ACADEMIC STANDARDS ALIGNMENT.....                                    | 3  |
| THE COMMON CORE STATE STANDARDS:                                     |    |
| ENGLISH LANGUAGE ARTS STANDARDS » READING: LITERATURE .....          | 3  |
| ENGLISH LANGUAGE ARTS STANDARDS » READING: FOUNDATIONAL SKILLS ..... | 4  |
| ENGLISH LANGUAGE ARTS STANDARDS » WRITING .....                      | 5  |
| NEXT GENERATION SCIENCE STANDARDS:                                   |    |
| FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES .....          | 6  |
| ENGINEERING DESIGN .....   | 6  |
| LAVISH LEXICON – A CROSSWORD PUZZLE .....                            | 7  |
| LAVISH LEXICON – A CROSSWORD PUZZLE CLUES .....                      | 8  |
| LAVISH LEXICON – A CROSSWORD PUZZLE ANSWER GUIDE.....                | 9  |
| NOODLES’ PERSPECTIVE – A STUDY OF POINT OF VIEW.....                 | 10 |
| THE CAST OF CHARACTERS – A DROPPED PHRASE PUZZLE .....               | 13 |
| THE LIFE AND TIMES OF THE KENNEWICKETTS – A BINGO GAME.....          | 15 |
| THE IRE OF IRON CLAW BINGO GAME BOARD.....                           | 16 |
| THE IRE OF IRON CLAW BINGO GAME CARDS.....                           | 17 |
| THE IRE OF IRON CLAW BINGO GAME ANSWERS .....                        | 18 |
| KNIVES’ THUMB – A ROBOTICS PROJECT .....                             | 19 |
| THE HOBO – HISTORY ON THE MOVE.....                                  | 23 |
| REFERENCES.....  | 24 |
| ACKNOWLEDGMENTS.....   | 25 |

## ACADEMIC STANDARDS ALIGNMENT

### THE COMMON CORE STATE STANDARDS

#### English Language Arts Standards » Reading: Literature

|                           |  | Crossword Puzzle | Point of View | Dropped Phrase | Bingo | Robotics | The Hobo |
|---------------------------|--|------------------|---------------|----------------|-------|----------|----------|
| CCSS.ELA-Literacy.RL.4.1  | Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.   |                  | x             |                |       |          |          |
| CCSS.ELA-Literacy.RL.4.3  | Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text (e.g., a character's thoughts, words, or actions).   |                  | x             |                |       |          |          |
| CCSS.ELA-Literacy.RL.4.4  | Determine the meaning of words and phrases as they are used in a text, including those that allude to significant characters found in mythology (e.g., Herculean).   | x                |               | x              |       |          |          |
| CCSS.ELA-Literacy.RL.4.7  | Make connections between the text of a story or drama and a visual or oral presentation of the text, identifying where each version reflects specific descriptions and directions in the text.               |                  |               |                | x     |          |          |
| CCSS.ELA-Literacy.RL.4.10 | By the end of the year, read and comprehend literature, including stories, dramas, and poetry, in the grades 4-5 text complexity band proficiently, with scaffolding as needed at the high end of the range. | x                | x             | x              | x     | x        | x        |
| CCSS.ELA-Literacy.RL.5.1  | Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.  |                  | x             |                |       |          |          |
| CCSS.ELA-Literacy.RL.5.3  | Compare and contrast two or more characters, settings, or events in a story or drama, drawing on specific details in the text (e.g., how characters interact).   |                  | x             |                |       |          |          |
| CCSS.ELA-Literacy.RL.5.4  | Determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes.  | x                |               | x              | x     |          |          |

### English Language Arts Standards » Reading: Literature (cont.)

|                           |   | Crossword Puzzle | Point of View | Dropped Phrase | Bingo | Robotics | The Hobo |
|---------------------------|---|------------------|---------------|----------------|-------|----------|----------|
| CCSS.ELA-Literacy.RL.5.10 | By the end of the year, read and comprehend literature, including stories, dramas, and poetry, at the high end of the grades 4-5 text complexity band independently and proficiently.   | x                | x             | x              | x     | x        | x        |
| CCSS.ELA-Literacy.RL.6.1  | Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.   |                  | x             |                |       |          |          |
| CCSS.ELA-Literacy.RL.6.3  | Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.  |                  | x             |                |       |          |          |
| CCSS.ELA-Literacy.RL.6.4  | Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone  | x                |               | x              | x     |          |          |
| CCSS.ELA-Literacy.RL.6.10 | By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6-8 text complexity band proficiently, with scaffolding as needed at the high end of the range.   | x                | x             | x              | x     | x        | x        |
| CCSS.ELA-Literacy.RL.7.4  | Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama. | x                |               | x              | x     |          |          |
| CCSS.ELA-Literacy.RL.7.10 | By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6-8 text complexity band proficiently, with scaffolding as needed at the high end of the range.   | x                | x             | x              | x     | x        | x        |

### English Language Arts Standards » Reading: Foundational Skills

|                            |   |   |  |   |  |  |  |
|----------------------------|---|---|--|---|--|--|--|
| CCSS.ELA-Literacy.RF.4.3   | Know and apply grade-level phonics and word analysis skills in decoding words.  | x |  | x |  |  |  |
| CCSS.ELA-Literacy.RF.4.3.a | Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context. | x |  | x |  |  |  |
| CCSS.ELA-Literacy.RF.5.3   | Know and apply grade-level phonics and word analysis skills in decoding words.  | x |  | x |  |  |  |
| CCSS.ELA-Literacy.RF.5.3.a | Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context. | x |  | x |  |  |  |

## English Language Arts Standards » Writing

|                           |  | Puzzle | Point of View | Dropped Phrase | Bingo | Robotics | The Hobo |
|---------------------------|--|--------|---------------|----------------|-------|----------|----------|
| CCSS.ELA-Literacy.W.4.2   | Write informative/explanatory texts to examine a topic and convey ideas and information clearly.   |        |               |                | x     | x        | x        |
| CCSS.ELA-Literacy.W.4.3   | Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.  |        | x             |                |       |          |          |
| CCSS.ELA-Literacy.W.4.3.a | Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally.   |        | x             |                |       |          |          |
| CCSS.ELA-Literacy.W.4.8   | Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.                          |        |               |                | x     | x        | x        |
| CCSS.ELA-Literacy.W.5.2   | Write informative/explanatory texts to examine a topic and convey ideas and information clearly.   |        |               |                | x     | x        | x        |
| CCSS.ELA-Literacy.W.5.3   | Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.  |        | x             |                |       |          |          |
| CCSS.ELA-Literacy.W.5.3.a | Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally.   |        | x             |                |       |          |          |
| CCSS.ELA-Literacy.W.5.8   | Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. |        |               |                | x     |          |          |
| CCSS.ELA-Literacy.W.6.2   | Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.                                  |        |               |                | x     | x        | x        |
| CCSS.ELA-Literacy.W.6.3   | Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.   |        | x             |                |       |          |          |
| CCSS.ELA-Literacy.W.6.3.a | Engage and orient the reader by establishing a context and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.                                      |        | x             |                |       |          |          |
| CCSS.ELA-Literacy.W.7.2   | Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.                                  |        |               |                | x     | x        | x        |
| CCSS.ELA-Literacy.W.7.3   | Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.   |        | x             |                |       |          |          |

### English Language Arts Standards » Writing (cont.)

|                           |   | Crossword Puzzle | Point of View | Dropped Phrase | Bingo | Robotics | The Hobo |
|---------------------------|---|------------------|---------------|----------------|-------|----------|----------|
| CCSS.ELA-Literacy.W.7.3.a | Engage and orient the reader by establishing a context and point of view and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically. |                  | x             |                |       |          |          |

## NEXT GENERATION SCIENCE STANDARDS

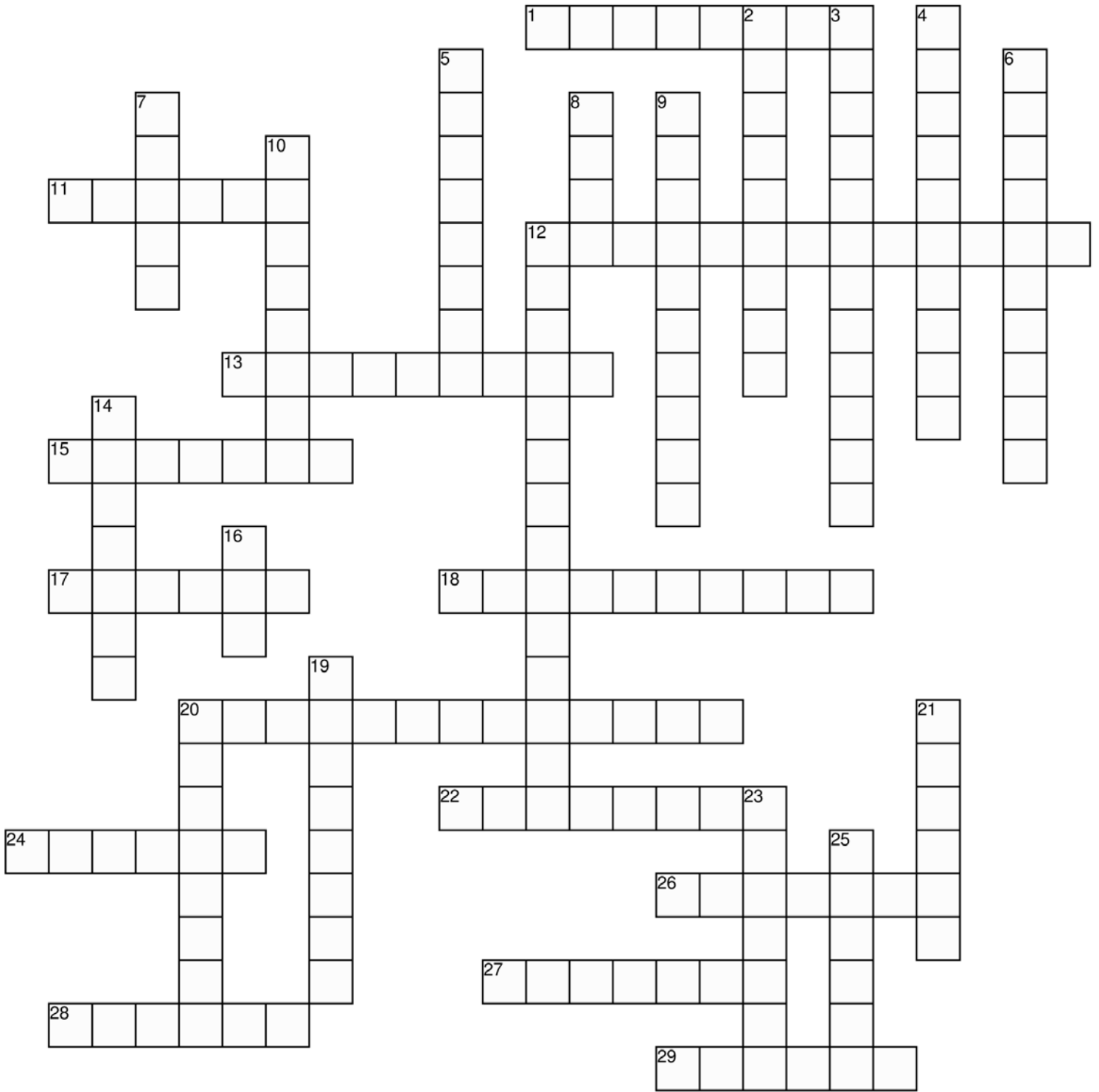
### From Molecules to Organisms: Structures and Processes

|            |  |  |  |  |  |   |  |
|------------|--|--|--|--|--|---|--|
| S-LS1-3    | Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function   |  |  |  |  | x |  |
| XC-SF-MS-1 | Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts; therefore, complex natural and designed structures/systems can be analyzed to determine how they function. |  |  |  |  | x |  |
| XC-SF-MS-2 | Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.   |  |  |  |  | x |  |
| XC-P-LE-1  | Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.  |  |  |  |  | x |  |

### Engineering Design

|            |  |  |  |  |  |   |  |
|------------|--|--|--|--|--|---|--|
| 3-5-ETS1-1 | Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. |  |  |  |  | x |  |
|------------|--|--|--|--|--|---|--|

# LAVISH LEXICON – A CROSSWORD PUZZLE



## LAVISH LEXICON — A CROSSWORD PUZZLE CLUES

### **Across:**

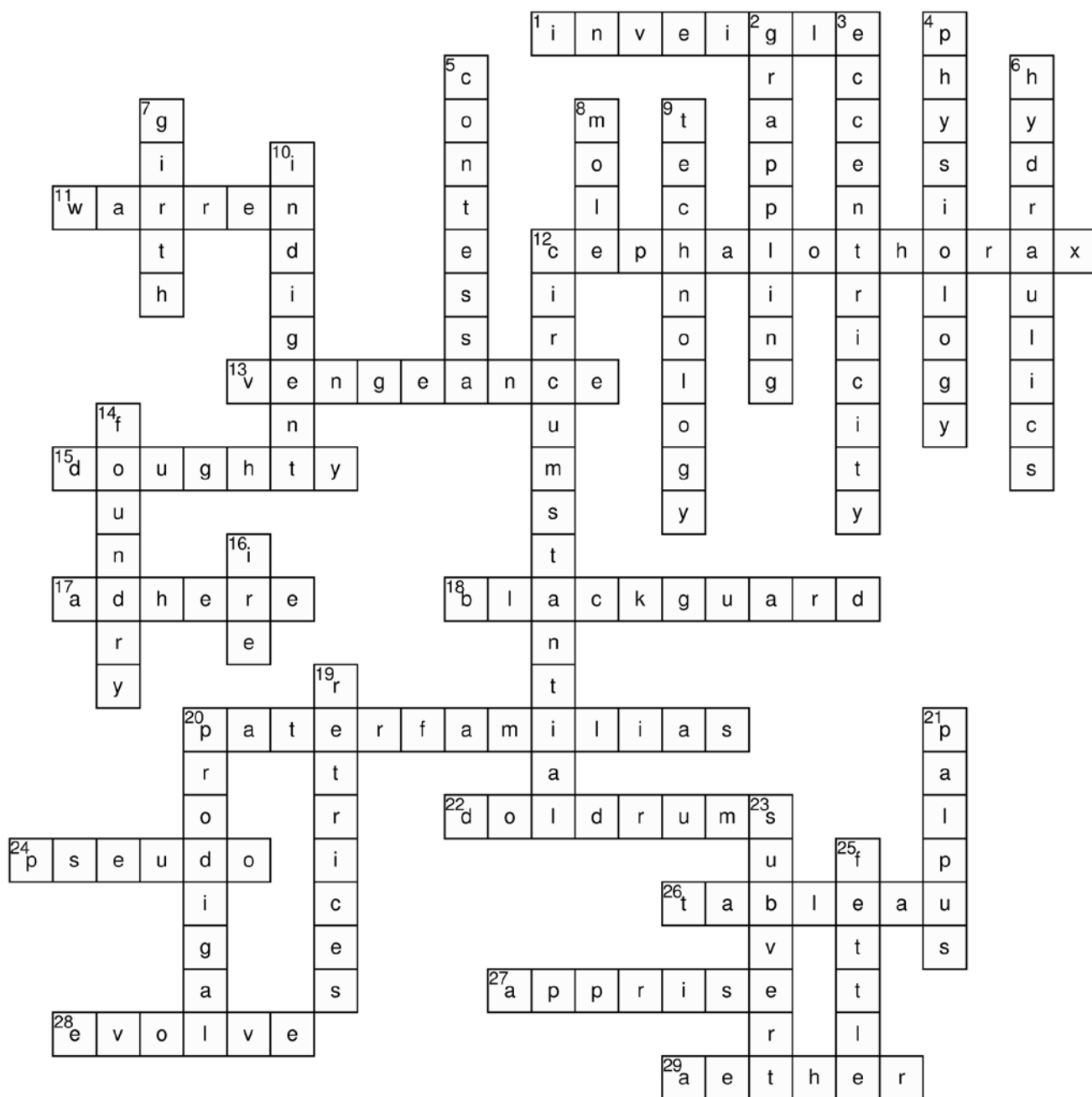
1. To entice or coax (pg. 13)
11. Underground home of rabbits (pg. 89)
12. Portion of the spider to which the legs are attached (pg. 50)
13. Retaliation for another's act (pg. 2)
15. Brave and persistent (pg. 88)
17. Stick fast to something (pg. 110)
18. Person with rotten heart (pg. 123)
20. Man who is the head of a family (pg. 48)
22. Ocean area near equator where lack of wind traps boats for days (pg. 117)
24. False (pg. 50)
26. A building or room set on a high spot commencing an excellent view (pg. 8)
27. Tell someone about (pg. 105)
28. To develop from something simple into something more complex (pg. 75)
29. Space between solid matter in the universe (pg. 41)

### **Down:**

2. \_\_\_\_\_ hook (pg. 124)
3. Strange and unusual behavior (pg. 100)
4. The way a living creature's body functions (pg. 70)
5. Italian countess (pg. 27)
6. The branch of science concerned with conveyance of pressurized liquids through pipes (pg. 138)
7. Measurement around the middle of something (pg. 35)
8. A person you know and trust who is betraying you (pg. 8)
9. The science of mechanical and industrial arts (pg. 85)
10. Person too poor to provide for or shelter for themselves (pg. 37)
12. \_\_\_\_\_ evidence (pg. 99)
14. Establishment in which molten metal is poured into molds (pg. 155)
16. Anger (word found in the title)
19. Tail feathers (pg. 82)
20. Someone who is wasteful or spends extravagantly (pg. 52)
21. One of a pair of appendages beside the mouth of an arachnid (pg. 51)
23. Overthrow completely (pg. 2)
25. Fine \_\_\_\_\_ (pg. 149)



## LAVISH LEXICON – A CROSSWORD PUZZLE ANSWER GUIDE

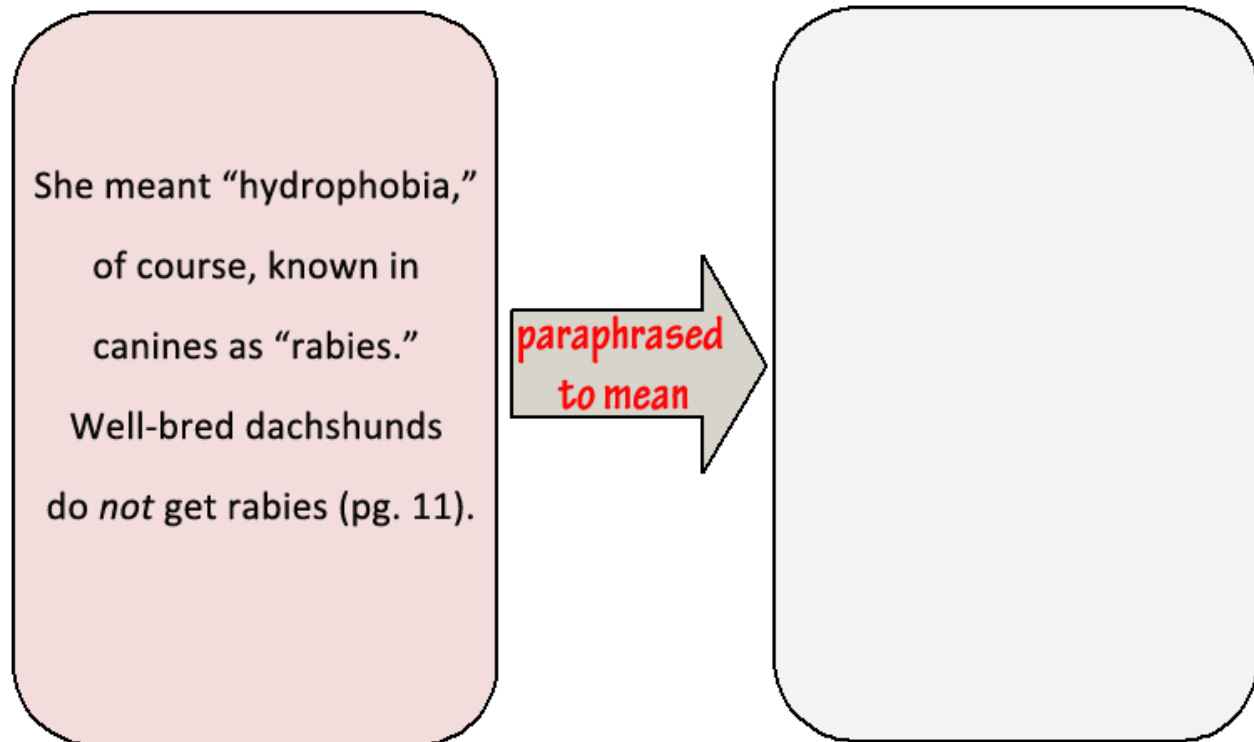


## NOODLES' PERSPECTIVE – A STUDY OF POINT OF VIEW

*Noodles is an extremely intelligent dachshund, a wise and perceptive canine, indeed. Being that the story is told from his point of view, the reader can get a sense of his personality by the comments he makes about being a dachshund. It's interesting to note that the dachshund is one of the top dog breeds in the U.S. – known for their playfulness, determination and ferocity. Sounds like Noodles, right?*

*In this lesson, the student is asked to paraphrase the phrases presented on pages 11-12 in this guide. To "paraphrase" means to express the meaning of the speaker using different words, to a reword something written by someone else. Consider setting, scene, and plot when determining how to paraphrase the cited quotations. Use the book as a reference, if need be.*

*The boxes on the left contain cited quotations from the text. Read them, interpret their meaning, and write a paraphrase in the box on the left. Get creative and have some fun with this!*



Dachshunds do *not* approve of derring-do, at least not when there is work to be done. Dustbunnies, which are nothing but springs and cogs inside, should not be the least inclined to indulge in it (pg. 26).

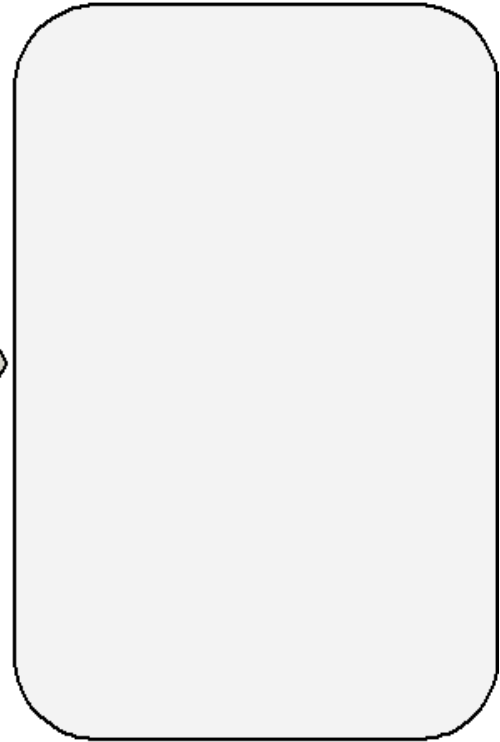
paraphrased  
to mean

No one had noticed my arrival, and my presence was missed amid the chaos, but I did not whine. Dachshunds are known for their courage (pg. 62).

paraphrased  
to mean

With a mighty squirm,  
I was through the netting.  
*Dachshunds do not  
abandon  
their best friends (pg. 156).*

paraphrased  
to mean



## THE CAST OF CHARACTERS — A DROPPED PHRASE PUZZLE

*Unscramble the characters names below.*

*Use the numbers beneath the letter boxes to solve the quote at the bottom of the page.*

LONSEDO

|   |    |    |    |    |  |  |
|---|----|----|----|----|--|--|
|   |    |    |    |    |  |  |
| 9 | 18 | 35 | 10 | 45 |  |  |

RINO LAWC

|   |    |  |  |  |  |    |  |
|---|----|--|--|--|--|----|--|
|   |    |  |  |  |  |    |  |
| 8 | 13 |  |  |  |  | 32 |  |

LEATWR

|  |   |  |    |  |    |  |
|--|---|--|----|--|----|--|
|  |   |  |    |  |    |  |
|  | 5 |  | 39 |  | 21 |  |

MADNII

|   |    |  |    |  |    |  |
|---|----|--|----|--|----|--|
|   |    |  |    |  |    |  |
| 7 | 47 |  | 40 |  | 44 |  |

SEMMER

|  |  |    |  |  |    |  |
|--|--|----|--|--|----|--|
|  |  |    |  |  |    |  |
|  |  | 11 |  |  | 27 |  |

GIOZM

|   |  |  |  |  |  |
|---|--|--|--|--|--|
|   |  |  |  |  |  |
| 2 |  |  |  |  |  |

LOASYCP

|  |    |  |    |    |    |    |  |
|--|----|--|----|----|----|----|--|
|  |    |  |    |    |    |    |  |
|  | 29 |  | 26 | 48 | 34 | 16 |  |

LE TSA

|    |    |  |  |    |  |
|----|----|--|--|----|--|
|    |    |  |  |    |  |
| 33 | 28 |  |  | 12 |  |

SINVEK

|  |    |  |    |   |  |
|--|----|--|----|---|--|
|  |    |  |    |   |  |
|  | 41 |  | 19 | 4 |  |

BYLLI

|    |  |    |  |  |  |
|----|--|----|--|--|--|
|    |  |    |  |  |  |
| 25 |  | 46 |  |  |  |

KETSERDESUT

|    |  |  |    |  |    |    |    |    |   |  |  |
|----|--|--|----|--|----|----|----|----|---|--|--|
|    |  |  |    |  |    |    |    |    |   |  |  |
| 24 |  |  | 17 |  | 20 | 30 | 31 | 38 | 3 |  |  |

NIVMEL

|  |    |    |  |   |    |  |
|--|----|----|--|---|----|--|
|  |    |    |  |   |    |  |
|  | 23 | 37 |  | 1 | 15 |  |

VESJEE

|  |    |    |  |  |    |  |
|--|----|----|--|--|----|--|
|  |    |    |  |  |    |  |
|  | 14 | 49 |  |  | 42 |  |

TCEKTENNESWIK

|  |  |    |    |  |    |    |  |  |  |  |   |  |  |  |
|--|--|----|----|--|----|----|--|--|--|--|---|--|--|--|
|  |  |    |    |  |    |    |  |  |  |  |   |  |  |  |
|  |  | 22 | 50 |  | 43 | 36 |  |  |  |  | 6 |  |  |  |

**F**

|   |   |   |   |   |  |
|---|---|---|---|---|--|
|   |   |   |   |   |  |
| 2 | 3 | 4 | 5 | 6 |  |

|   |   |   |    |    |  |
|---|---|---|----|----|--|
|   |   |   |    |    |  |
| 7 | 8 | 9 | 10 | 11 |  |

|    |    |    |
|----|----|----|
|    |    |    |
| 12 | 13 | 14 |

|    |    |    |
|----|----|----|
|    |    |    |
| 15 | 16 | 17 |

|   |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|
|   |    |    |    |    |    |    |    |
| 2 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |

|    |    |
|----|----|
|    |    |
| 25 | 26 |

|   |    |    |    |    |
|---|----|----|----|----|
|   |    |    |    |    |
| 2 | 27 | 28 | 29 | 30 |

|          |    |    |    |    |  |
|----------|----|----|----|----|--|
| <b>H</b> |    |    |    |    |  |
| 31       | 32 | 27 | 33 | 34 |  |

|          |    |    |    |    |    |    |  |
|----------|----|----|----|----|----|----|--|
| <b>H</b> |    |    |    |    |    |    |  |
| 35       | 13 | 27 | 36 | 25 | 37 | 38 |  |

|          |    |    |   |    |
|----------|----|----|---|----|
| <b>H</b> |    |    |   |    |
| 39       | 40 | 41 | 2 | 42 |

|    |    |    |    |
|----|----|----|----|
|    |    |    |    |
| 43 | 44 | 45 | 46 |

|          |    |    |    |    |
|----------|----|----|----|----|
| <b>H</b> |    |    |    |    |
| 47       | 48 | 48 | 49 | 50 |

~ Calypso (pg. 47)

## THE CAST OF CHARACTERS – A DROPPED PHRASE PUZZLE ANSWERS

LONSEDO **N O O D L E S**  
 9 18 35 10 45  
 RINO LAWC **I R O N** **C L A W**  
 8 13 32  
 LEATWR **W A L T E R**  
 5 39 21  
 MADNII **M A D I N I**  
 7 47 40 44  
 SEMMER **M E S M E R**  
 11 27  
 GIOZM **G I Z M O**  
 2  
 LOASYCP **C A L Y P S O**  
 29 26 48 34 16  
 LETSA **T E S L A**  
 33 28 12  
 SINVEK **K N I V E S**  
 41 19 4  
 BYLLI **B I L L Y**  
 25 46  
 KETSERDESUT **D U S T K E T E E R S**  
 24 17 20 30 31 38 3  
 NIVMEL **M E L V I N**  
 23 37 1 15  
 VESJEE **J E E V E S**  
 14 49 42  
 TCEKTENNESWIK **K E N N E W I C K E T T S**  
 22 50 43 36 6

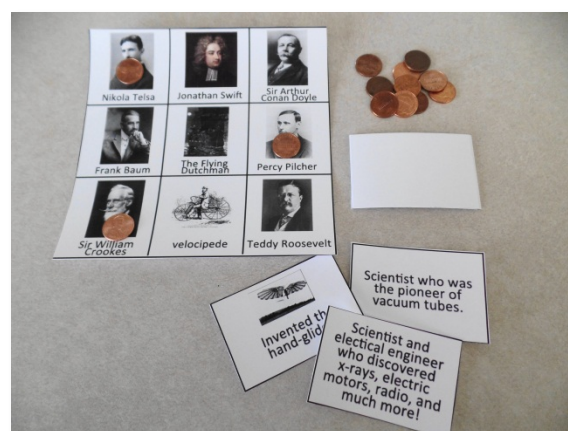
**I F** **G R E A T** **M I N D S** **A R E** **N O T** **G O V E R N E D** **B Y**  
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 2 18 19 20 21 22 23 24 25 26  
**G R E A T** **H E A R T S** , **H O R R I B L E** **T H I N G S** **W I L L**  
 2 27 28 29 30 31 32 27 33 34 35 13 27 36 25 37 38 39 40 41 2 42 43 44 45 46  
**H A P P E N** . ~ *Calypso (pg. 47)*  
 47 48 48 49 50

## THE LIFE AND TIMES OF THE KENNEWICKETTS — A BINGO GAME

**Objective:** To describe characters, settings, and major events in a story in a game-like manner.

### Materials:

- *The Ire of Iron Claw*
- Cardstock
- Scissors
- *The Ire of Iron Claw* Bingo Board (Guide, pg. 16)
- *The Ire of Iron Claw* Game Cards (Guide, pg. 17-19)
- *The Ire of Iron Claw* Bingo Answer Sheet (Guide, pg. 20)
- 9 game pieces (pennies, buttons, beans, etc.) per player












### Procedure:

- Depending on how many players will be competing, print 2 to 4 *The Ire of Iron Claw* Bingo Boards on cardstock.
- Print double copies of *The Ire of Iron Claw* Game Cards.
- Use scissors to trim around the borders of the game board and the cards.
- To play the game, mix up game cards and stack them, face down.
- Each player manages their own game board and collection of game pieces.
- A player begins by choosing a card from the top of the stack. If the card matches a space on their board, they may mark the match with a game piece.
- Return card face down near original stack.
- As the game continues, a player loses a turn if they choose a card that has already been covered on their board.
- The winner has either blocked out 3 spaces in a row or covered all of the spaces, depending how the players decide they'd like to play.
- Definitions and description can be verified using the *Ire of Iron Claw* Bingo Answer Sheet.



**Writing Prompt:** *Ire of Iron Claw* is set during a time in history in which scientific discovery, engineering, and the creation literary works flourished – a rich era of innovation and creativity. Write an essay examining the historical aspects in the book. Analyze how the book's historical setting contributed to Will's characterization as well as the overall thrust of the story. Cite examples from the text in your essay.

THE IRE OF IRON CLAW BINGO GAME BOARD

|  |   |   |
|--|---|---|
|  <p>Nikola Telsa</p>              |  <p>Jonathan Swift</p>           |  <p>Sir Arthur<br/>Conan Doyle</p> |
|  <p>Frank Baum</p>               |  <p>The Flying<br/>Dutchman</p> |  <p>Percy Pilcher</p>             |
|  <p>Sir William<br/>Crookes</p> |  <p>velocipede</p>             |  <p>Teddy Roosevelt</p>          |



## THE IRE OF IRON CLAW BINGO GAME CARDS

Wrote  
*Gulliver's Travels.*

Legendary ghost  
ship that can never  
make port and is  
doomed to sail the  
oceans forever.

Scientist who was  
the pioneer of  
vacuum tubes.

Scientist and  
electrical engineer  
who discovered  
X-rays, electric  
motors, radio, and  
much more!



One of the inventors  
of the hang-glider.

Wrote the  
*Wizard of Oz.*

Known as the  
'bone-shaker,'  
this invention was  
the first real bicycle.

Once served as  
president of the  
United States.

Wrote  
*Sherlock Holmes.*

THE IRE OF IRON CLAW BINGO GAME ANSWERS


|                               |   |
|-------------------------------|---|
| <b>Nikola Telsa</b>           | Scientist and electrical engineer who discovered x-rays, electric motors, radio, and much, much more. |
| <b>Jonathan Swift</b>         | Wrote <i>Gulliver's Travels</i> .   |
| <b>Sir Arthur Conan Doyle</b> | Wrote <i>Sherlock Holmes</i> .  |
| <b>Frank Baum</b>             | Wrote <i>Wizard of Oz</i> .   |
| <b>The Flying Dutchman</b>    | Legendary ghost ship that can never make port and is doomed to sails the oceans forever.              |
| <b>Percy Pilcher</b>          | One of the inventors of the hang-glider.  |
| <b>Sir William Crookes</b>    | Scientist who was the pioneer of vacuum tubes.  |
| <b>velocipede</b>             | Known as the 'bone-shaker,' this invention was the first real bicycle.                                |
| <b>Teddy Roosevelt</b>        | Once served as the president of the United States.  |

## KNIVES' THUMB — A ROBOTICS PROJECT

*I craned my neck, trying to get one last look at Wally. And then I noticed Knives's hand was following us along the road, razorlike fingertips tapping on the cobbles as it came. For an instant I thought that Calypso had made yet another modification – and then I heard the tiny, tinny battle song of the Dustketeers (pg. 155).*

**Note:** In this lesson, students will use the instructions below as a guide for their own design of a robotic claw. Instruct students to define a simple design problem, one that reflects a specific need, similar to Knives's razorlike fingertips. The structure for Knives's hand reflects his design purpose – to cut and prepare food. In this project, students are encouraged to modify the construction format presented below based on a robot hand design purpose of their choosing.

For a further challenge, encourage the students to adapt the procedures involved in making a robotic hand to design a pigeon's claw similar to Iron Claw's. Use the planning worksheet provided in this guide for this project.

 As a follow up activity, students are instructed to write and present an informative, scientific paper in which they justify their design purpose, describe the construction process, and evaluate the functionality of their design.

**Objective:** To design structures specifically to serve particular functions taking into account how materials can be shaped and used.

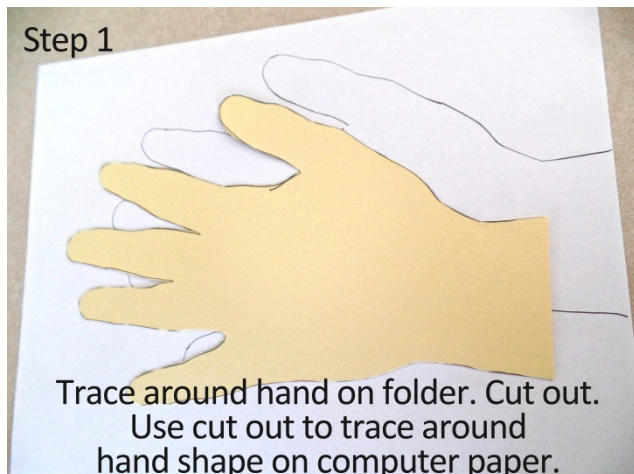
### Materials:

- File folder
- A sheet of computer paper
- Drinking straws
- Cello tape
- Scissors
- Ruler
- Yarn
- Fine-tipped marker
- Iron Claw Planning Worksheet (Guide, pg. 22)

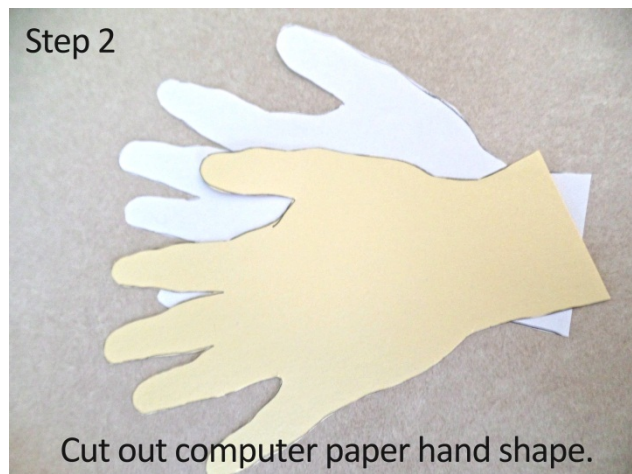


**Procedure:**

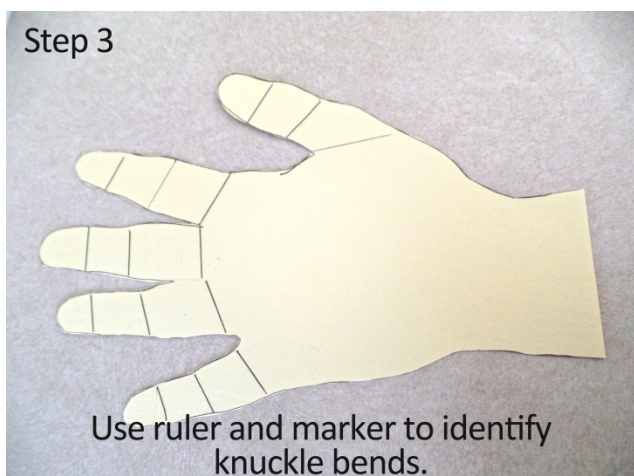
Step 1



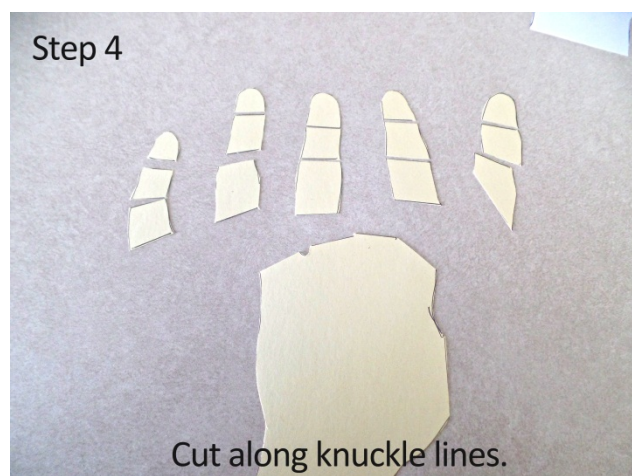
Step 2



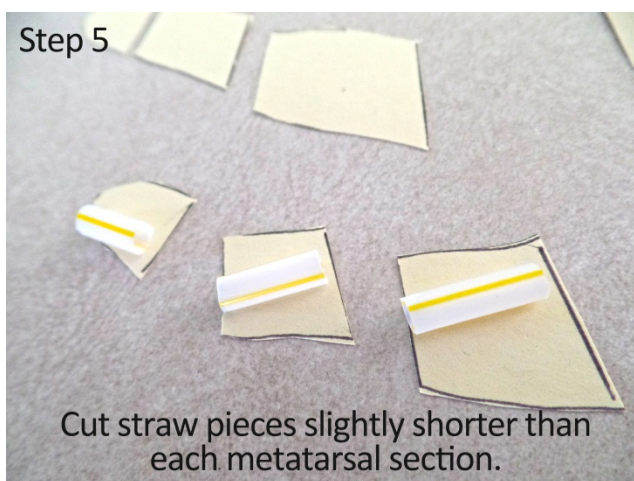
Step 3



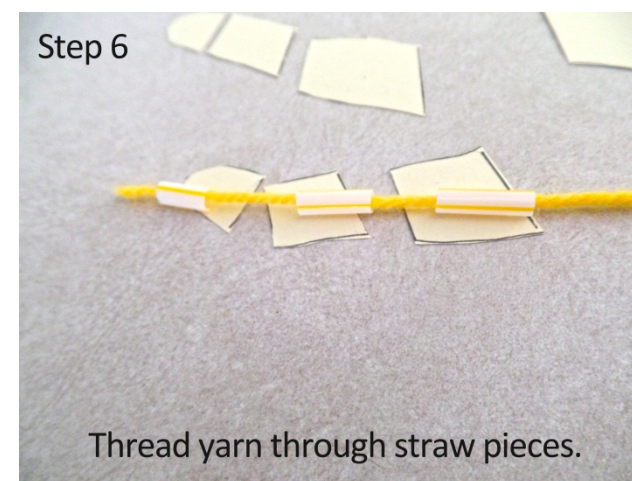
Step 4



Step 5



Step 6

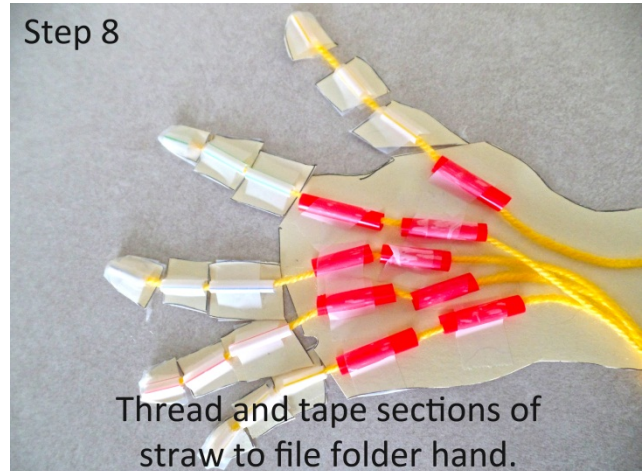


## Step 7



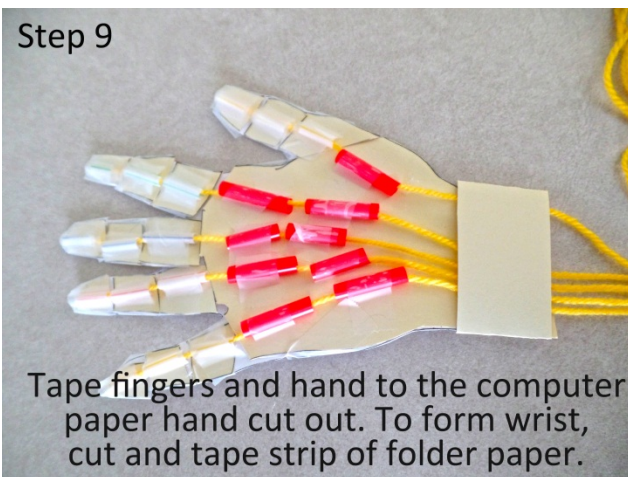
Tape straw to metatarsal.  
Fold yarn behind the fingertip.  
Secure with tape.

## Step 8



Thread and tape sections of  
straw to file folder hand.

## Step 9



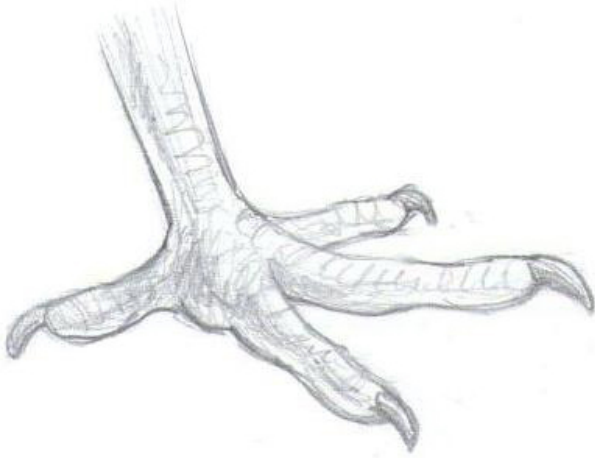
Tape fingers and hand to the computer  
paper hand cut out. To form wrist,  
cut and tape strip of folder paper.

## Step 10



Place hand on wrist cuff.  
With your other hand, gently  
tug at threads.  
Fingers and thumb will curl.

## IRON CLAW'S CLAW A PROJECT PLANNER



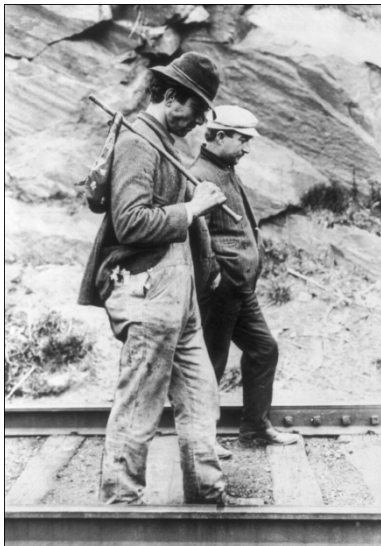
List the additional materials required to construct a pigeon's claw.

Explain the robotic hand design modifications required to construct a pigeon's claw.

Describe the steps required to construct a pigeon's claw.


## THE HOBO — HISTORY ON THE MOVE

*Oliver nodded. "Indigence is not always an indication of ill breeding," he said. "It can be the mark of misfortune, or simply a call of adventure. I don't suppose that we could travel as hobos – (pg. 104)."*



From the 1880's to the 1930's hobos were a familiar sight along the railroads and back roads of America. They were travelers, always looking for a cheap way to get from here to there. Hoping to find work, opportunities, and also a bit of adventure, they lived on the road, hopping freight trains and stowing away in boxcars. The train workers were never happy about these stowaways, and men were even hired to keep watch and kick them off the trains if they were caught. Hobos weren't lazy though; they were workers. They were just workers who wandered as they went, never staying in one place for long.

~ [Layers of Learning](#)

 Explore the world of the hobo. Research the hobo jungle. Learn about the hobo code of honor. Discover what life was like for the hobo. Use your research to analyze the author's reasoning to cast hobos as important characters in the story. Explain the meaning behind Oliver's words in the quote printed at the top of the page. List your references and cite examples from the text in your essay.

**Access the links below to discover fascinating information about the hobo.**

- The Hobo's Life by [Geocaching](#)
- Hobos by [Layers of Learning: From Our Homeschool to Yours](#)
- How to Be a Hobo by [The Art of Manliness](#)
- Hoboglyphs: Secret Transient Symbols & Modern Nomad Codes by [Web Urbanist](#)

## REFERENCES

- "Arthur Conan Doyle." *Wikipedia*. Wikimedia Foundation. Web. 9 Mar. 2015.  
<[https://en.wikipedia.org/wiki/Arthur\\_Conan\\_Doyle](https://en.wikipedia.org/wiki/Arthur_Conan_Doyle)>.
- "BetterLesson." *BetterLesson*. Web. 10 Mar. 2015. <[http://betterlesson.com/home?from=header\\_logo](http://betterlesson.com/home?from=header_logo)>.
- "Fliegender Holländer (Sage)." *Wikipedia*. Wikimedia Foundation. Web. 9 Mar. 2015.  
<[http://de.wikipedia.org/wiki/Fliegender\\_Holländer\\_\(Sage\)](http://de.wikipedia.org/wiki/Fliegender_Holländer_(Sage))>.
- "Hobo's Life." *GC45HBN (Unknown Cache) in Florida, United States Created by Auyantepuy*. Web. 9 Mar. 2015. <[http://www.geocaching.com/geocache/GC45HBN\\_hobos-life](http://www.geocaching.com/geocache/GC45HBN_hobos-life)>.
- "Hobos - Layers of Learning." *Layers of Learning*. 16 Mar. 2011. Web. 9 Mar. 2015. <<http://www.layers-of-learning.com/hobos/>>.
- "How to Be a Hobo." *The Art of Manliness*. Web. 9 Mar. 2015.  
<<http://www.artofmanliness.com/2009/09/10/how-to-be-a-hobo/>>.
- "How to Draw Pigeons." , *Step by Step, Birds, Animals, FREE Online Drawing Tutorial, Added by Makageni, April 19, 2013, 5:03:56 Pm*. Web. 11 Mar. 2015.
- "Jonathan Swift." *Wikipedia*. Wikimedia Foundation. Web. 9 Mar. 2015.  
<[https://en.wikipedia.org/wiki/Jonathan\\_Swift](https://en.wikipedia.org/wiki/Jonathan_Swift)>.
- "L. Frank Baum." *Wikipedia*. Wikimedia Foundation. Web. 9 Mar. 2015.  
<[https://en.wikipedia.org/wiki/L.\\_Frank\\_Baum](https://en.wikipedia.org/wiki/L._Frank_Baum)>.
- "Nikola Tesla." *Wikipedia*. Wikimedia Foundation. Web. 9 Mar. 2015.  
<[https://en.wikipedia.org/wiki/Nikola\\_Tesla](https://en.wikipedia.org/wiki/Nikola_Tesla)>.
- "Percy Pilcher." *Wikipedia*. Wikimedia Foundation. Web. 9 Mar. 2015.  
<[https://en.wikipedia.org/wiki/Percy\\_Pilcher](https://en.wikipedia.org/wiki/Percy_Pilcher)>.
- "Robot Hand Project Discovery." *YouTube*. YouTube. Web. 9 Mar. 2015.  
<<https://www.youtube.com/watch?v=phqYMupHn94>>.
- "Robotic Hands." 10 Feb. 2013. Web. 9 Mar. 2015. <<http://www.daysinwiththekids.com/big-kid-days/science-days/robotic-hands/>>.
- "Velocipede." *Wikipedia*. Wikimedia Foundation. Web. 9 Mar. 2015.  
<<https://en.wikipedia.org/wiki/Velocipede>>.
- "William Crookes." *Wikipedia*. Wikimedia Foundation. Web. 9 Mar. 2015.  
<[https://en.wikipedia.org/wiki/William\\_Crookes](https://en.wikipedia.org/wiki/William_Crookes)>.



## ACKNOWLEDGMENTS



### ABOUT THE AUTHOR

Kersten Hamilton is the author of several picture books and many novels, including the acclaimed YA paranormal trilogy *The Goblin Wars*. When she's not writing, she hunts dinosaurs in the deserts and badlands near Albuquerque, New Mexico, where she lives. For more about Kersten, please visit [www.kerstenhamilton.com](http://www.kerstenhamilton.com).

### ABOUT THE ILLUSTRATOR

James Hamilton is an artist and designer who lives in Albuquerque, New Mexico.

### ABOUT THE CREATORS OF THIS GUIDE

Debbie Gonzales earned her MFA in Writing for Children and Young Adults from the Vermont College of Fine Arts. She's the author of eight transitional readers for New Zealand publisher, Giltedge. A Montessori teacher, former school administrator and adjunct professor, Debbie devotes her time to writing books for kids, crafting teacher guides and various other freelance projects. To find out more about Debbie access her website at [www.debbiegonzales.com](http://www.debbiegonzales.com).



Moriah Ellig is a graphic designer, snowboarder, traveler, book-lover, and graduated Summa Cum Laude from Montana State University with a BFA in graphic design and an Honors Baccalaureate with Highest Distinction. She's interested in helping people connect to each other and the world around them. Learn more about Moriah and her work at [www.moriahelligdesign.com](http://www.moriahelligdesign.com).