THE EARLY DAYS OF FLIGHT

A. Define, Describe, or Identify:

1. Lift – the upward force on an aircraft against gravity. (p. 18)
2. Aerial reconnaissance – looking over battlefields from the sky. (p. 18)
3. Dirigible – a steerable airship. (p. 18)
4. Rudder – a movable flap or blade attached to the rear of a craft. (p. 18)
5. Keel – a structure that extends along the center of a craft from the front to the back. (p. 19)
6. Internal-combustion machine – an engine in which the fuel is burned inside, rather than in an external furnace. (p. 19)
7. Aeronaut – someone who travels in an airship or balloon. (p. 20)
8. Drag – the pull, or slowing effect, of air on an aircraft. (p. 22)
9. Thrust – the forward force driving an aircraft. (p. 22)
10. Biplane – an aircraft with two main supporting surfaces, usually placed one above the other. (p. 23)
12. Monoplane – an airplane with one set of wings. (p. 23)
**B. Matching:**

Match the definition in Column A with the name in Column B. You may use each name only once.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
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<tbody>
<tr>
<td><strong>f</strong> 1. He organized the Rough Riders to help Cuba win independence</td>
<td>a. Count von Zeppelin</td>
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<td>from Spain. (p. 16)</td>
<td>b. Henri Giffard</td>
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<td><strong>e</strong> 2. He is credited with inventing the hot-air balloon. (p. 16)</td>
<td>c. Laurenço Gusmão</td>
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<td><strong>i</strong> 3. His observations before the fireplace led to the first</td>
<td>d. Abraham Lincoln</td>
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<td>manned balloon flight. (p. 17)</td>
<td>e. Alberto Santos-Dumont</td>
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<td><strong>h</strong> 4. He and a passenger made the first manned hydrogen balloon</td>
<td>f. Theodore Roosevelt</td>
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<td>flight. (p. 18)</td>
<td>g. Paul Haenlein</td>
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<td><strong>b</strong> 5. Most historians give him credit for inventing the first</td>
<td>h. J. A. C. Charles</td>
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<tr>
<td>successful dirigible. (p. 18)</td>
<td>i. Joseph Montgolfier</td>
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<td><strong>g</strong> 6. In 1872, he built a dirigible with an internal-combustion</td>
<td>j. Thaddeus Lowe</td>
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<td>engine. (p. 19)</td>
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<td><strong>e</strong> 7. He became famous for flying an airship around the Eiffel</td>
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<td>Tower. (p. 19)</td>
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<td><strong>a</strong> 8. He built and flew the first successful dirigible. (p. 19)</td>
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<td><strong>j</strong> 9. He made President Lincoln realize how useful balloons could</td>
<td></td>
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<td>be in wartime. (p. 20)</td>
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<td><strong>d</strong> 10. It took a note from him to get General Scott to meet with</td>
<td></td>
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<tr>
<td>Thaddeus Lowe. (p. 20)</td>
<td></td>
</tr>
</tbody>
</table>
C. True/False:

Put a T in the blank if the sentence is true and an F if it is false.

__F__ 1. During the Battle of San Juan Hill, the Army had plenty of balloons in reserve because the government had just taken over a defunct balloon factory. (p. 14)

__T__ 2. In the early days, balloonists had to carry fuel with them. (p. 17)

__F__ 3. In their research on balloons, the Montgolfier brothers discovered a new gas. (p. 17)

__F__ 4. A breakthrough in aeronautics came when balloonists started using pure oxygen instead of hydrogen for their balloons. (p. 18)

__T__ 5. The Zeppelin rigid dirigibles had roomy wood-paneled cabins and carried 20 or more passengers. (p. 19)

__F__ 6. When a balloon section was established in the US Army in 1892, the United States was the only country to have balloons in its armed services. (p. 21)

__T__ 7. Sir George Cayley came up with the idea of using a fixed wing for lift and a separate system for propulsion. (p. 22)

__T__ 8. John J. Montgomery and Otto Lilienthal both died in glider accidents. (p. 23)

__T__ 9. In 1848 John Stringfellow’s steam-driven model airplane made the first successful powered flight by a heavier-than-air craft. (p. 23)

__F__ 10. Historians fault Samuel Langley for spending too much time trying to control his aircraft and not enough on powering it. (p. 24)
D. Word Find:

Unscramble the words below and write them in the blanks. Then find and circle the words in the puzzle.

Dirigible  1. DELBIGERI
Rudder  2. DURRED
Monoplane  3. NEONAPLOM
Reconnaissance  4. EIRANESNOCSNAC
Keel  5. ELEK
Zeppelin  6. PLENIPEZ
Drag  7. GRAD
Thrust  8. STRUTH
Airscrew  9. RISCAREW
Patent  10. NAPETT
Aeronaut  11. TARAUNOE
Biplane  12. ELANBIP
Helium  13. MILEUH
Hydrogen  14. ENYDGHOR
E. Multiple Choice:
Circle the letter that provides the best answer.

1. Who was the American diplomat who observed J. A. C. Charles’s demonstration of a hydrogen balloon?
   a. Theodore Roosevelt.
   b. Benjamin Franklin.* (p. 18)
   c. John Adams.
   d. Abraham Lincoln.

2. Who discovered steam power?
   b. Joseph Montgolfier.
   c. Benjamin Franklin.
   d. James Watt.* (p. 18).

3. When he gave a demonstration of a surveillance balloon over the National Mall in Washington, how did Thaddeus Lowe transmit messages to the ground below?
   a. By sending over a telegraph wire.* (p. 20)
   b. By using signal flags.
   c. By using signal lanterns.
   d. By blowing on a special Army bugle in Morse code.

4. Who picked up where Leonardo da Vinci left off in developing gliders?
   a. Benjamin Franklin.
   b. Otto Lilienthal.
   c. Sir George Cayley.* (p. 22)
   d. Alberto Santos-Dumont.

5. Who received a patent for designing an aircraft theoretically capable of carrying a man?
   a. The Wright brothers.
   b. W. S. Henson and John Stringfellow.* (p. 23)
   c. The Montgolfier brothers.
   d. Thaddeus Lowe and Joseph Henry.

6. What provided the power for Samuel Langley’s first flying models?
   a. Compressed gas.
   b. Small mechanical springs.
   c. Rubber bands.* (p. 24)
   d. Small internal-combustion machines.