

TEACHER GUIDE TO STUDENT WORKSHEET 1- THINKING ABOUT INVENTIONS

Example: Primary Source 1: Drawbaugh invention

1. What does it look like this machine is made of? **metal**
2. Describe this device's different parts. **hopper, handcrank, six tubes, wooden base**
3. How might a person use it? **musical instrument, pour something in the top and turn the handle, candle mold/maker, or any reasonable answer**
4. Does this invention remind you of any modern-day inventions? If so, what? **accept any reasonable answer**
5. How do you think this invention was used? (circle one)
 - a. **b. to make a daily job easier**
6. If you had to give this invention a name, what would you call it? **answers will vary**

Extra information about the Drawbaugh coin counter

Daniel Drawbaugh was born in Cumberland County, Pennsylvania in 1827. As a boy in school he was whipped for working during class time on a model of a windmill. When he grew up, he worked as a mechanic, repairing clocks and tools. He also was quite an inventor himself, patenting over 120 inventions.

One of them was the coin counter. Coins were poured in the top of the device and fell through a series of holes that sorted coins by their sizes. A hand crank agitated the coins to help them move through the grates. Coins were sorted into tubes where they could be removed and counted.

Primary Source 2: Ferris invention

1. What does it look like this machine is made of? **metal (steel), glass**
2. Describe this device's different parts. **pair of giant hoops, wires (spokes), boxes (places for people to sit), two supports holding up the axel**
3. How might a person use it? **sit in the box and go around in a circle**
4. Does this invention remind you of any modern-day inventions? If so, what? **Ferris Wheel at an amusement park**
5. How do you think this invention was used? (circle one)
 - a. **for fun**
6. If you had to give this invention a name, what would you call it? **Ferris Wheel**

Extra information about the Ferris Wheel

George Ferris was born in 1859 in Illinois. He went to college to become an engineer (someone who designed bridges, tunnels, and other structures). He moved to Pittsburgh and worked in the bridge-building business.

In 1891 planners of the World's Fair issued a challenge for someone to build a huge structure to serve as an attraction for the 1893 Columbian Exposition. Ferris was interested. As a child, he had been fascinated by waterwheels. With this in mind, he designed a "monster" wheel for the Fair. It was over 25 stories high and had 36 glass and steel passenger compartments the size of railroad cars. When full, the wheel could hold 2,160 passengers.

It worked perfectly and made a profit. Unfortunately, Ferris had to sue the World's Fair directors for his profits. Also, he spent much time and money in court cases to protect his idea from being copied. He died penniless at the age of 37. The original Ferris wheel was later demolished for scrap metal.

Primary Source 3: Pitcairn invention

1. What does it look like this machine is made of? **metal (steel), wood , rubber**
2. Describe this device's different parts. **propellers sticking out of the top of the machine, propeller sticking out of an engine at the front of the machine, wings, tail, fuselage (body)**
3. How might a person use it? **by sitting in it and flying**
4. Does this invention remind you of any modern-day inventions? If so, what? **airplane and a helicopter**
5. How do you think this invention was used? (circle one)
 - a. **for transportation**
6. If you had to give this invention a name, what would you call it? **answers will vary**

Extra information about the Pitcairn autogiro

In 1923, a Spanish inventor named Juan de la Cierva invented a flying machine that looked like a cross between a helicopter and an airplane. It had wings like an airplane and horizontal blades like a helicopter. However, the horizontal blades were not attached to a motor. They helped lift the machine off the ground when it was moving forward. De la Cierva named his invention the "Autogiro."

Harold Pitcairn was a Pennsylvanian with an aviation business located Northeast of Philadelphia in Bryn Athlyn. He learned about the autogiro and started experiments of his own on how to improve the aircraft. In 1929 Pitcairn became a partner with de la Cierva, and the Pitcairn Autogiro Company, as his business was named, began manufacturing autogiros for the public to buy and use. To boost his invention, Pitcairn got the famous pilot Amelia Earhart to demonstrate how high the autogiro could fly. (Show a transparency of **Amelia Earhart making a stop on her cross-country flight in the Beech-Nut autogiro at Reading, Pennsylvania Airport, 1931** to illustrate her publicity work for Pitcairn's company.)

By the 1940s it seemed that helicopters with powered rotors were the future, rather than the unpowered rotor of the autogiro. The last autogiros were produced in 1947. These aircraft remain in use today among amateur pilots.

Primary Source 4: Sholes invention

1. What does it look like this machine is made of? **wood, plastic, paper (scroll)**
2. Describe this device's different parts. **An upright box with round, white keys on the front, paper scroll on top.**
3. How might a person use it? **For writing something or accept any reasonable answer (Students may think it looks like a musical invention.)**
4. Does this invention remind you of any modern-day inventions? If so, what? **accept any reasonable answer**
5. How do you think this invention was used? (circle one)
 - a. **to make a daily job easier**
6. If you had to give this invention a name, what would you call it? **answers will vary**

Extra information about the Sholes typewriter

Christopher Sholes was born in Mercersburg, Pennsylvania in 1819. He learned about the printing trade in Danville, PA. Later he moved to Wisconsin. In 1867 he had an idea for a mechanical writing machine using keys similar to a piano. The **Drawing for a Typewriter, by Christopher Latham Sholes, June 23, 1868 (see image)**, shows the piano-like keys. The paper was held upside-down at the top of the device, where the type struck the paper, leaving a mark.

One big problem with the machine was that the typist couldn't see what was being typed, since the keys hit the paper from below. Also, if a typist was too quick, the keys would jam. Another business associate, James Densmore of Meadville, PA, suggested an arrangement of keys that separated the most-used letters from each other. Called the "QWERTY keyboard," it is the arrangement used on keyboards today.

Display **Sholes Letter** transparency for students to see one of the first typed documents.