**ITEM NO. 12**

**DISCOVERIES AND INVENTIONS**

**The Evolution Of The Female Inventor**

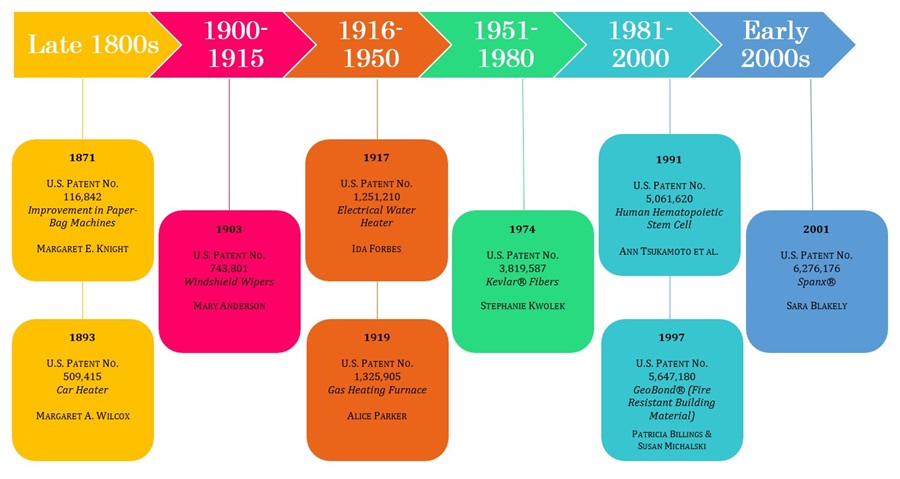
AUTHOR(S) Stephanie D. Scruggs , Jessica L Zurlo 29/3/2018

Source: Bradley.com /Abridged article/

<https://www.bradley.com/insights/publications/2018/03/the-evolution-of-the-female-inventor>

As Women’s History Month draws to a close, let’s take a moment to celebrate some of the impressive innovations of female inventors and take a closer look at the evolution of the female inventor over the past 150 years.

While the timeline below highlights contributions by female inventors associated with many of the technologies still being used in some form today, a study by the Institute for Women’s Policy Research estimates that in 2010, less than 20 percent of all patents named at least one female inventor. Using this data along with available data on female inventors from the late 1800s and 1970s, the trend line predicts that by 2050, we may only see about one-quarter of all patents issued naming at least one female inventor. Other statistical analysis claims that the amount of female inventors from 2010 to 2015 averaged about 10.3 percent, which, based on the trend line, would result in less than 15 percent of all patents issued in 2050 naming at least one female inventor.



The growth in the number of female inventors lags behind the growing number of women obtaining STEM, i.e., science, technology, engineering, and math, degrees in 2015 (about 30 percent according to the Office of the Chief Economist).There is no clear answer to why this lag exists, but a review of the path to female inventorship may lend some insight.

**Challenges for Female Inventors Before the Mid-1900s**

Prior to the 20th century, women, especially married women, faced restrictions on the ability to own property (such as patents), enter into contracts, earn a salary, and gain the technical skills and knowledge that often leads to a successful invention .These restrictions made it difficult, if not impossible, for an innovative woman to be motivated to pursue an invention or, if she did, properly be credited with her invention. For instance, take Margaret Knight’s machine for producing the flat-bottom grocery bag. Even though Knight designed a machine that could produce 1,000 flat-bottom bags per day, she had to rely on the courts to prove that she, rather than Charles Annan, conceived of the invention. Apparently, after Annan viewed a prototype being built for Knight, he filed for and obtained a patent detailing the invention. It was only after Knight produced copious designs and drawings on her invention that she was awarded U.S. Patent Nos. 116,842 and 220,925 in the 1870s.

Entering the market was equally challenging until recent years. Many female inventors worked tirelessly to overcome the stigma associated with women in business during the 19th and first half of the 20th centuries (mainly their purported physical and mental inferiority to men) and win over the support of investors, manufacturers and retailers. It was not uncommon for female inventors to be rejected hundreds of times before one manufacturer would reluctantly agree to make the product or one investor would contribute just enough capital to jump start the company.

Q1 The article is a celebration of

1. Women’s Day
2. Evolution of invention
3. Female inventors
4. U.S. Patent

|  |  |  |
| --- | --- | --- |
| **Domain:** Reading Literacy | **Theme: Discoveries and Inventions** | Classes: 8  Expected Time: 1 min Total Credit: 2 |
| **Description of Item**   |  |  | | --- | --- | | Yes | Text | | Yes | Image | |  | Table | |  | Graph | |  | Map | |  | Poem | | **Learning Outcome:**  Evaluate and reflect | |

**Reading Literacy**

|  |  |
| --- | --- |
| FRAMEWORK | CHARACTERISTICS |
| Situation/Scenario/Context | Occupational |
| Text Format | Mixed |
| Text Type | Exposition |
| Cognitive Process | Evaluate and reflect |
| Item Format | Simple MCQ |
| Proficiency Level | 1 b |

**Credit Pattern:**

**Full Credit: 2**

**Partial Credit: NA**

**No Credit: 0**

**Description of Answer Key and Credits:**

|  |
| --- |
| Full credit: female inventors  No credit: Any other response/no response |

Q2 Complete the table with information from the article.

|  |  |  |
| --- | --- | --- |
| Patent year | Inventor | Product |
|  |  | Electrical water heater |
|  | Alice Parker |  |
| 1903 |  |  |

|  |  |  |
| --- | --- | --- |
| **Domain:** Reading Literacy | **Theme: Discoveries and Inventions** | Classes: 8  Expected Time: 2 mins  Total Credit: 2 |
| **Description of Item**   |  |  | | --- | --- | | Yes | Text | | Yes | Image | |  | Table | |  | Graph | |  | Map | |  | Poem | | **Learning Outcome:**  Deduce the meaning of graphic text | |

**Reading Literacy**

|  |  |
| --- | --- |
| FRAMEWORK | CHARACTERISTICS |
| Situation/Scenario/Context | Occupational |
| Text Format | Mixed |
| Text Type | Exposition |
| Cognitive Process | Locate information |
| Item Format | Close constructed |
| Proficiency Level | 1 a |

**Credit Pattern:**

**Full Credit: 2**

**Partial Credit: 1**

**No Credit: 0**

**Description of Answer Key and Credits:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Full credit:   |  |  |  | | --- | --- | --- | | Patent year | inventor | product | | **1917** | **Ida Forbes** | Electrical water heater | | **1919** | Alice Parker | **Gas Heating Furnace** | | 1903 | **Mary Anderson** | **Windshield Wipers** |   Partial Credit: 4 or more correct responses  No credit: Any other response/no response |

Q3 What is the time gap between the invention of electrical water heater and fire resistant building material? Compose your answer in terms of decades.

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| **Domain:** Reading Literacy | **Theme: Discoveries and Inventions** | Classes: 8  Expected Time: 2 mins  Total Credit: 2 |
| **Description of Item**   |  |  | | --- | --- | | Yes | Text | | Yes | Image | |  | Table | |  | Graph | |  | Map | |  | Poem | | **Learning Outcome:**  Evaluate and reflect | |

**Reading Literacy**

|  |  |
| --- | --- |
| FRAMEWORK | CHARACTERISTICS |
| Situation/Scenario/Context | Occupational |
| Text Format | Mixed |
| Text Type | Exposition |
| Cognitive Process | Evaluate and reflect |
| Item Format | Short response |
| Proficiency Level | 2 |

**Credit Pattern:**

**Full Credit: 2**

**Partial Credit: NA**

**No Credit: 0**

**Description of Answer Key and Credits:**

|  |
| --- |
| Full credit: 8 decades.  No credit: 80 years/Any other response/no response |

Q4. Between 1903 and 1991 the approximate number of products patented by US was

1. 4317819
2. 5061620
3. 743801
4. 743162

|  |  |  |
| --- | --- | --- |
| **Domain:** Reading Literacy | **Theme: Discoveries and Inventions** | Classes: 8  Expected Time: 2 mins  Total Credit: 2 |
| **Description of Item**   |  |  | | --- | --- | | Yes | Text | | Yes | Image | |  | Table | |  | Graph | |  | Map | |  | Poem | | **Learning Outcome:**  Evaluate and reflect | |

**Reading Literacy**

|  |  |
| --- | --- |
| FRAMEWORK | CHARACTERISTICS |
| Situation/Scenario/Context | Occupational |
| Text Format | Mixed |
| Text Type | Exposition |
| Cognitive Process | Evaluate and reflect |
| Item Format | Complex MCQ |
| Proficiency Level | 2 |

**Credit Pattern:**

**Full Credit: 2**

**Partial Credit: NA**

**No Credit: 0**

**Description of Answer Key and Credits:**

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| --- |
| Full credit: 4317819  No credit: Any other response/no response |

Q5 What could be the possible reasons behind the lag in the growth of the number of female inventors?

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| --- | --- | --- |
| **Domain:** Reading Literacy | **Theme: Discoveries and Inventions** | Classes: 8  Expected Time: 3 mins  Total Credit: 2 |
| **Description of Item**   |  |  | | --- | --- | | Yes | Text | | Yes | Image | |  | Table | |  | Graph | |  | Map | |  | Poem | | **Learning Outcome:**  Evaluate and reflect | |

**Reading Literacy**

|  |  |
| --- | --- |
| FRAMEWORK | CHARACTERISTICS |
| Situation/Scenario/Context | Occupational |
| Text Format | Mixed |
| Text Type | Exposition |
| Cognitive Process | Evaluate and reflect |
| Item Format | close constructed |
| Proficiency Level | 2 |

**Credit Pattern:**

**Full Credit: 2**

**Partial Credit: NA**

**No Credit: 0**

**Description of Answer Key and Credits:**

|  |
| --- |
| Full credit: any 3 right responses   * married women, faced restrictions on the ability to own property (such as patents), enter into contracts, earn a salary, and gain the technical skills and knowledge that often leads to a successful invention. * Restrictions made it difficult, if not impossible, for an innovative woman to be motivated to pursue an invention or, if she did, she was not credited for it * banks routinely denied business loans to women * Prototypes were copied and patented by men before the actual female inventors could obtain. * Female inventors had to face the stigma associated with women in business   Partial credit: any 2 right response  No credit: Any other response/no response |

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