

**The Transistor Radio****Inventions that Shook the World Series****Grade Levels:**

5-12

**Subject Areas:**

Technology

Engineering

**Synopsis:**

Masaru Ibuka and Akio Morita founded Sony in Japan after World War II. They wanted to break into the American market with a new product. With the new, small transistors, Ibuka and Morita created the transistor radio. Morita brings it to America to sell it, but refused to allow Bulova Watch Company to put their name on the product.

**Learning Objectives:** Students will:

- Understand why Sony was struggling in post-World War II Japan.
- Understand why Ibuka and Morita wanted to break into the American market.
- Explain the challenges Ibuka and Morita had to overcome when creating the transistor radio.

**Vocabulary:**

Sony, transistor radio, Masaru Ibuka, Akio Morita, transistor, Phosphorus dumping, marketing

**Pre-Viewing Discussion:**

How do you think your life would be different today if no one had ever created a portable radio?

How do you think some of today's large electronics companies got started?

**Post-Viewing Discussion:**

Why did Sony struggle after World War II? Why did they want to break into the American market?

How did Phosphorus dumping improve the capabilities of the transistor? What other challenges did Ibuka and Morita face in creating the transistor radio?

What was Morita's most important business decision he ever made? Why was it so important? How did he eventually break into the American market?

**Further Activities:**

Research the way portable music devices have changed since Sony's invention. What has stayed consistent, and what has changed dramatically?

Research Sony's history and write a biography of Ibuka and Morita. Be sure to include the personality characteristics that helped make them successful and the challenges they faced.

**The Artificial Satellite**  
**Inventions that Shook the World Series**

**Grade Levels:**

5-12

**Subject Areas:**

Technology

Engineering

Primary Source

**Synopsis:**

Sergei Korolev was sentenced to 10 years in a Siberian labor camp after World War II. When he was released, the Soviet Union tapped him to create a rocket that would allow them to launch a nuclear warhead against countries around the world. Korolev thought he could use the same style rocket to launch a satellite that would orbit earth, and eventually he created Sputnik.

**Learning Objectives:** Students will:

- Understand the relationship between the Soviet Union and America during the 1950s.
- Understand why the Soviet Union wanted to launch a satellite.
- Explain the challenges Korolev had to overcome when creating the rocket and satellite.

**Vocabulary:**

Satellite, Sputnik, Sergei Korolev, Soviet Union, Space Race, Cold War

**Pre-Viewing Discussion:**

Why do you think America and the Soviet Union wanted to get into outer space in the 1950s? What advantage was there to being the first to reach outer space?

What was the Cold War? What happened to the Soviet Union in later decades?

**Post-Viewing Discussion:**

Why do you think Sergei Korolev agreed to help the Soviet Union after he was imprisoned in Siberia?

How did Korolev's rocket work to launch Sputnik? What challenges did Korolev have to overcome in the design and creation of the rocket that launched the satellite?

How did Americans react to the successful launch of Sputnik? How do you think that affected the American relationship with the Soviet Union during this time?

**Further Activities:**

Compare America's relationship with the Soviet Union in the 1950s to America's relationship with Russia in the 21<sup>st</sup> century. What is the same? What is different? Are there relationships between America and other countries today that are similar to that of America and the Soviet Union in the 1950s?

**The Black Box Recorder**  
**Inventions that Shook the World Series**

**Grade Levels:**

5-12

**Subject Areas:**

Technology

Engineering

Primary Source

**Synopsis:**

David Warren is part of a team of aviation officials that investigate plane crashes. He has the idea to record what happens in the cockpit of an airplane to aid the investigation, should the plane crash. His superiors and aviation officials are unimpressed, and even express concerns about privacy. Eventually, Warren meets Robert Hardingham from Britain, and his device takes off.

**Learning Objectives:** Students will:

- Understand the challenges of investigating a plane crash, both before and after the invention of the black box recorder.
- Explain the concerns of the aviation authorities regarding Warren's device.

**Vocabulary:**

Black box recorder, David Warren, Robert Hardingham, privacy, investigation

**Pre-Viewing Discussion:**

How do you think authorities investigated plane crashes prior to the invention of the black box recorder?

What do you think the reaction was to the first black box recorder?

**Post-Viewing Discussion:**

What was David Warren's job? What did his superiors do when he came to them with the idea for a black box recorder?

What did Warren use for a recording medium? Why did he choose that medium?

What were some of the concerns about the data recorder voiced by aviation authorities? How did Robert Hardingham react to Warren's idea?

How successful was Warren's idea? What recognition did he receive for his accomplishment?

**Further Activities:**

Research the development of the black box recorder and the privacy concerns it raised. How were these concerns similar to privacy concerns in our world today? What do you think about privacy in today's world? Explain your opinion.

**The Breathalyzer****Inventions that Shook the World Series****Grade Levels:**

5-12

**Subject Areas:**

Science

Technology

Engineering

**Synopsis:**

Robert Borkenstein is working in a crime lab, and has seen too many drunk driving incidents. He begins to wonder how he can develop a test for intoxication. Starting with how the body processes alcohol, and working from the previously designed "drunkometer," Borkenstein develops a machine that not only detects the presence of alcohol, but can tell the user what their blood alcohol level actually is.

**Learning Objectives:** Students will:

- Understand what sparked Robert Borkenstein to create the breathalyzer.
- Explain how the breathalyzer works.
- Understand the creativity and perseverance Borkenstein had to have to complete his invention.

**Vocabulary:**

Robert Borkenstein, drunk driving, forensics, drunkometer, densitometer

**Pre-Viewing Discussion:**

How do you think authorities combatted drunk driving before the breathalyzer?

How do you think a breathalyzer works? Do you think the results are reliable?

**Post-Viewing Discussion:**

Why did Borkenstein want to create a test for drunken-ness? How has that changed the way police deal with drunk drivers since the 1950s?

What were some of the problems with the drunkometer? How did Borkenstein fix them?

How did Borkenstein's breathalyzer work?

**Further Activities:**

Research the development of the breathalyzer and the challenges associated with it. How did the public react to this new test? How did law enforcement use it?

Find out when police can require you to submit to a breathalyzer. Are you allowed to refuse the test? What might happen if you refuse?

**The Hovercraft****Inventions that Shook the World Series****Grade Levels:**

5-12

**Subject Areas:**

Technology

Engineering

**Synopsis:**

Once Christopher Cockerell retires, he is bothered by the casualties of the landing at Normandy on D-Day. His idea is to build an amphibious vehicle that can be used in such military maneuvers. He has to overcome friction, and does so by creating a vehicle that hovers just above the surface of the ground or water: the hovercraft.

**Learning Objectives:** Students will:

- Understand what sparked Christopher Cockerell to create the hovercraft.
- Explain how the hovercraft works.
- Understand the creativity and perseverance Cockerell had to have to complete his invention.

**Vocabulary:**

Christopher Cockerell, D-Day, friction, hovercraft, amphibious vehicle

**Pre-Viewing Discussion:**

What do you think drove Christopher Cockerell to create the hovercraft? What do you think the advantages are to a hovercraft?

How do you think this new invention was initially received? Can you think of places where hovercraft are used today?

**Post-Viewing Discussion:**

Why did Cockerell want to create an amphibious vehicle? Why did he decide on the hovercraft?

How did Cockerell create the hovercraft? How did his testing go? How was his invention initially received?

What caused people in Britain to suddenly have an interest in Cockerell's hovercraft? Why do you think they were suddenly interested?

**Further Activities:**

Research the development of the hovercraft and the challenges associated with it. How did the public react to this new mode of transportation?

Find out where hovercraft are being used in our world today. What makes them ideal for certain situations or environments?