

## Ocean Expert Exchange - Educator Resources

**TOPIC: *Pioneering Underwater Camera Systems***

**FEATURED EXPERT: *Casey Sapp of VRTUL***

**TARGETED LEARNING STANDARDS:** NGSS Connections to Nature of Science - Science is a Human Endeavor  
Technological advances have influenced the progress of science and science has influenced advances in technology.  
Science and engineering are influenced by society and society is influenced by science and engineering.

### **MIDDLE SCHOOL NGSSS:**

**CTE-TECED.68.ENGTEC.04:** Demonstrate an understanding of the engineering process.

**CTE-TECED.68.ENTECH.01:** Identify and explore careers in Engineering and Technology Education.

**CTE-TECED.68.ENTECH.03:** Demonstrate an understanding of the characteristics and scope of technology.

**CTE-TECED.68.ENTECH.05:** Demonstrate an understanding of the relationships among technologies and the connection between technology and other fields of study.

**CTE-TECED.68.ENTECH.11:** Demonstrate an understanding of engineering design.

**CTE-TECED.68.ENTECH.12:** Demonstrate an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

**CTE-TECED.68.ENTECH.13:** Demonstrate the abilities to apply the design process.

**SC.6.N.1.5:** Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence.

**SC.6.N.2.3:** Recognize that scientists who make contributions to scientific knowledge come from all kinds of backgrounds and possess varied talents, interests, and goods.

### **HIGH SCHOOL NGSSS:**

**SC.912.N.1.1:** Define a problem based on a specific body of knowledge; pose questions, conduct systematic observations, examine books and other sources of information to see what is already known, review what is known in light of empirical evidence, plan investigations, use tools to gather, analyze, and interpret data...

**SC.912.N.1.2:** Describe and explain what characterizes science and its methods

### **SUPPLEMENTAL RESOURCES:**

- 360/VR Video Short - National Geographic [360° Great Hammerhead Shark Encounter](#) (K-12 resource)
- 3D Model - ANGARI Foundation & Digital Life [Great Hammerhead Shark 3D Model](#) (K-12 resource)
- Video Short - Greg Foot & VRTUL [The Making of an Epic Underwater Google Expedition](#) (K-12 resource)
- 360/VR Video Library - Casey Sapp/VRTUL [Underwater 360 Videos](#) (K-12 resource)
- 360/VR Fieldtrips & Lessons - NOAA NMS [Sanctuaries 360° Virtual Reality Lesson Plans](#) (K-12 resource)
- 360/VR Expedition - ANGARI Foundation [Generation Ocean: Coral Reefs](#) (K-12 resource)
- Lesson - Google [Create a 360-degree Tour in Tour Creator](#) & [Tour Creator](#) (Secondary resource)
- 360/VR Resource Library - Google Education [Expeditions, 360, AR & VR Content](#) (K-12 resource)
- Video Interview - StoriesXFuture [Underwater Filming with VRTUL](#) (Secondary resource)
- Resource Library - Univ. of Hawai'i [Ocean Depths \(Light in the Ocean & Pressure\)](#) (Secondary resource)
- Software - Autodesk® [Fusion 360 CAD / CAM / CAE cloud-based platform](#) (Secondary resource)