



The Square One Education Network in partnership with Michigan Technological University and support from the Michigan Space Grant Consortium present the two-day workshop:

## **Building Underwater Remotely Operated Vehicles (ROVs) In the Classroom**

**February 22 & 23 at Oak Park High School, Oak Park MI**  
4pm-9pm Friday and 9am – 3pm Saturday (must attend both days)

### **Workshop Presenters:**

**Mr. Bill Grimm, Chemistry and Engineering Teacher, Oak Park High School, Oak Park MI**

Mr. Grimm has successfully incorporated ROVs in his urban classroom for the past several years and lends a unique perspective on engaging minority students via project-based learning.

**Workshop Overview:** K-12 educators, serving under-represented student populations (minorities, females) or those in under-resourced communities, with an interest in hands-on science, technology, engineering and mathematics (STEM) disciplines are invited to attend this exciting 2-day workshop that provides a truly unique educational opportunity. Participants will receive an instruction manual, materials and support to design, engineer and build a fully functional underwater remotely operated vehicle or ROV. STEM lessons, skills and activities presented in this workshop support standards and benchmarks in science, math and technology.

**Cost: \$490 per team of two or three** for workshop materials and instruction. Each team will receive in depth instruction, manual, and support as they design and build a fully functional ROV, control box, power source, and optical system valued at over \$800. Lunch and coffee included both days. All materials become the property of your school. **Make checks payable to Square One Education Network and mail to:** Barb Land at Square One, 670 Hillcliff Drive, Waterford MI 48328. For additional information contact Barb at 248.736.7537 or [barb@squareonenetwork.org](mailto:barb@squareonenetwork.org)



**SCECHs may available for this workshop at \$10/person.**

**Lodging & Meals:** Participants will be responsible for their own travel and lodging. We will forward the detailed information once your application has been accepted. **Space is limited.**

**Who is Square One?** The Square One Education Network is a 501c3 non-profit, educational organization dedicated to igniting the creative potential of students in the exploration of engineering, science and mathematics. Through professional development opportunities and classroom content, Square One supports innovative, project-based STEM learning in educational environments throughout Michigan, Ohio and Indiana.



## Building Underwater Remotely Operated Vehicles (ROV) in the Classroom Workshop

**Summary:** ROV engineering has been a unique and viable platform from which to teach applied science and engineering concepts, including aquatic studies. It is hoped that participants will bring back to their schools the knowledge and skills to actively engage students in real world learning and expose students to new career fields.

**Capacity & Future Use:** As a result of this workshop, 24 teachers will gain the skills and materials needed to excite and engage students at their respective schools. Previous experience has shown that building an ROV can sustain approximately 30-students/year/school. In addition over 85% of the materials (camera, motors, etc.) used in the workshop can be recycled for use in future years.

**Target Audience:** Upper Elementary, Middle and High school educators supporting students in under-resourced communities in science, technology, engineering, and mathematics with an interest in project based learning.

**Space is limited** – Eight teams of three will be selected to attend.

### During the ROV workshop participants will:

- Review lessons integrating ROVs into GLCES/ HSCES
- Build a fully functional small scale ROV and test its performance through a series of underwater challenges
- Gain an understanding of the unique challenges of the underwater environment
- Learn methods of propulsion and control in 3-D space; resolve issues of buoyancy and weight
- Acquire the knowledge, skills, and resources to mentor students in designing and building an ROV.
- Network with educators with similar interests and share "best practices" in teaching and instruction.
- Learn how to use the completed ROV to support other academic offerings (service learning, environmental science, social studies, etc.)

### Potential Participants should:

- Be a current teacher, administrator, or staff of a K-12 educational institution
- Form a **team of two or three** from the same school, district or ISD and submit an application
- Provide updates to the Square One team following the workshop—is the unit in use, in what way, involving how many students or teachers.

### To Apply:

- 1) Provide information for each team member (see attached application form)
- 2) Respond to Team questions on a separate page.
- 3) Send application and *administrator letter of support* via email to [barb@squareonetwork.org](mailto:barb@squareonetwork.org) Please type **ROV Workshop** in the subject line.



## ROV Workshop Application

**Please provide the following:**

- 1) Provide information for each team member – Be sure we have your most reliable contact information! Thanks!
- 2) Respond to Team questions on a separate page.
- 3) Letter of support from building administrator

**Teacher Name** \_\_\_\_\_ Email: \_\_\_\_\_  
First Last

Home Address: \_\_\_\_\_  
Street City State Zip Code

Work Phone: (\_\_\_\_) \_\_\_\_\_ Fax: (\_\_\_\_) \_\_\_\_\_ Cell Phone: (\_\_\_\_) \_\_\_\_\_

Name of School: \_\_\_\_\_

School/ Address: \_\_\_\_\_  
Street City State Zip Code

Subjects Taught: \_\_\_\_\_ Grades Taught: \_\_\_\_\_

Degree(s) Earned/Areas of Teacher Certification: \_\_\_\_\_

**Teacher #2 Name:** \_\_\_\_\_ Email: \_\_\_\_\_  
First Last

Home Address: \_\_\_\_\_  
Street City State Zip Code

Work Phone: (\_\_\_\_) \_\_\_\_\_ Fax: (\_\_\_\_) \_\_\_\_\_ Cell Phone: (\_\_\_\_) \_\_\_\_\_

Name of School: \_\_\_\_\_

School/ Address: \_\_\_\_\_  
Street City State Zip Code

Subjects Taught: \_\_\_\_\_ Grades Taught: \_\_\_\_\_

Degree(s) Earned/Areas of Teacher Certification: \_\_\_\_\_

**Teacher #3 Name:** \_\_\_\_\_ Email: \_\_\_\_\_  
First Last

Home Address: \_\_\_\_\_  
Street City State Zip Code

Work Phone: (\_\_\_\_) \_\_\_\_\_ Fax: (\_\_\_\_) \_\_\_\_\_ Cell Phone: (\_\_\_\_) \_\_\_\_\_

Name of School: \_\_\_\_\_

School/ Address: \_\_\_\_\_  
Street City State Zip Code

Subjects Taught: \_\_\_\_\_ Grades Taught: \_\_\_\_\_

Degree(s) Earned/Areas of Teacher Certification: \_\_\_\_\_



**Team Information** (please attach your brief typed responses to the following questions to your application):

1. Why do you want to participate in this workshop?
2. How does your team foresee using the materials, information and expertise you will obtain from this workshop? Specifically, how will you use the materials to:
  - a. Impact learning in your classroom or school?
  - b. Support project-based learning in your classroom or school?
  - c. Support other classes across the curriculum?
3. Composition of the student population and demographics served by your school (grades, ethnicity, economic levels, urban, suburban or rural)
4. Include any other special features of your team, school demographics, geographic area or student population that would support your application.

**We heard about this workshop from** (check ALL boxes that apply):

- |  |   |
|--|---|
| <input type="checkbox"/> Friend, colleague               | <input type="checkbox"/> Science Teachers Association     |
| <input type="checkbox"/> Teacher or school administrator | <input type="checkbox"/> Professional organization: _____ |
| <input type="checkbox"/> Website: _____                  | <input type="checkbox"/> List-serve: _____                |
| <input type="checkbox"/> Math/science center             | <input type="checkbox"/> Other: __parent_____             |

For questions or to submit your application, please contact:

**Square One Education Network**  
**Barb Land, COO**  
**670 Hillcliff Drive Waterford MI 48328**  
**248.736.7537 Fax 248.928.9033**  
[barb@squareonenetwork.org](mailto:barb@squareonenetwork.org)  
[www.squareonenetwork.org](http://www.squareonenetwork.org)