

Teaching  
with Small  
Boats Alliance  
Conference  
2017

April 26-29, 2017

Chesapeake Bay  
Maritime Museum  
St. Michaels, Md.



# Building Sailing Models of Bevin's Skiff

Flexible Teaching Tools introducing:  
Hand Tools  
"Real-World" Problem Solving  
Boat Building

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# Participants

- High School Marine CTE-
  - David Fawley, Center For Applied Technology South, Anne Arundel Schools, MD
- Middle School CTE-
  - Matt Cupples, Kenmore Middle School, Arlington, VA
- After School, Community Based Organization
  - Greg Pimentel, Science Out of School, Community Boating New Bedford, MA

# “Case studies”

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# Center of Applied Technology – South, Anne Arundel County Public Schools Marine Service Technology Program

Career Exploration, 9<sup>th</sup> grade



Level 1, year-long "A" days



Level 2, year-long, every day

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# Creating the Building Form

- ☐ Reading a Ruler
- ☐ Division of Fractions
- ☐ Combination Square
  - As marking gauge for parallel lines
  - Making Perpendicular Lines
- ☐ Bevel Angles
- ☐ Drill Fundamentals
- ☐ Screw as Inclined Plane wrapped around Cylinder





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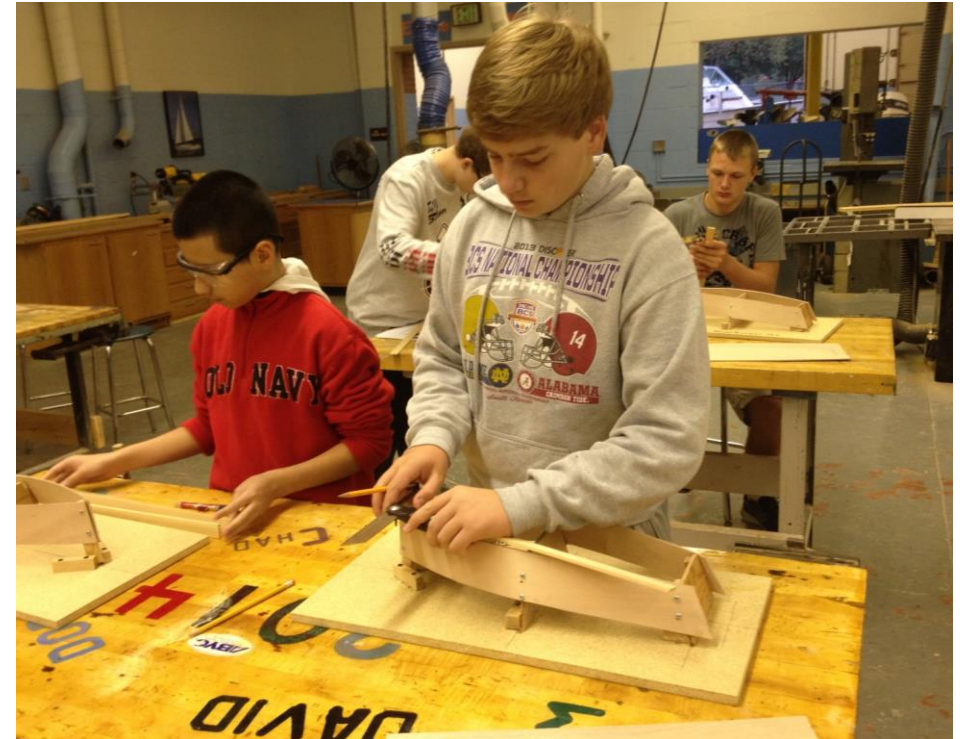
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## Forming the Boat

- ☐ Boat Terms and Vocabulary
- ☐ Geometry
  - Hand Plane
  - Flat Panels into 3-D Shapes
  - Congruency
- ☐ Band Saw Fundamentals
- ☐ Full Scale Bevin's Skiff Under Construction in Shop for Reference and Relevance



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## Finishing and Testing

- ☐ Boats Finished to Rails and Filling of Holes
  - ☐ Exothermic Reaction
  - ☐ Adhesive vs. Sealant
  - ☐ Cross Linked Polymer Chain
- ☐ Tow Tank (for fun, if time allows)
  - ☐ Mechanical Advantage of Falls
  - ☐ Dynamics of Resistance
  - ☐ "Form Follows Function"
  - ☐ Video Lesson on Science of Tow Tanks







# Card Stock Model at Beginning of Level 1

- ☐ Names of Boat Parts and Directions
- ☐ Differentiated and Kinesthetic Games  
Finding Boat Parts on Completed Boats in  
Shop in Tandem with Card Stock Build
- ☐ Sequence and Process of Build
- ☐ Larger Conversation about Buoyancy and  
Hull Design Theory





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# Assessment

- ☐ Bevin's Model with Freshman is Low Pressure
- ☐ "S" or "U" grading on criteria mostly relating to work habits and participation
- ☐ No one left behind
- ☐ "If we can build it, we can fix it."
- ☐ Wide variance in skill levels and aptitude
- ☐ Mistakes along the way are part of the process, not "failures".





# Hammond Middle School, Alexandria, VA

- 6<sup>th</sup> Grade CTE
- Underserved, On “Bubble” on State Math Test Score
- 100 served over 4 years





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# Educational Goals

- Math Remediation

## Assessment

- Daily Journal,
- Math Class Grade,
- State Standardized Math Test





# Kenmore Middle School, Arlington, VA

- Afterschool Enrichment
- Self Selecting, High Performing





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# Educational Goals

- Engagement with Building Process
- Hands on Application of Math

# Assessment

- Project Based Rubric

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# Community Boating, New Bedford

- A year-round youth development organization
- Ages 7+, predominantly inner city, at-risk students
- Improves students' lives through boats and boating





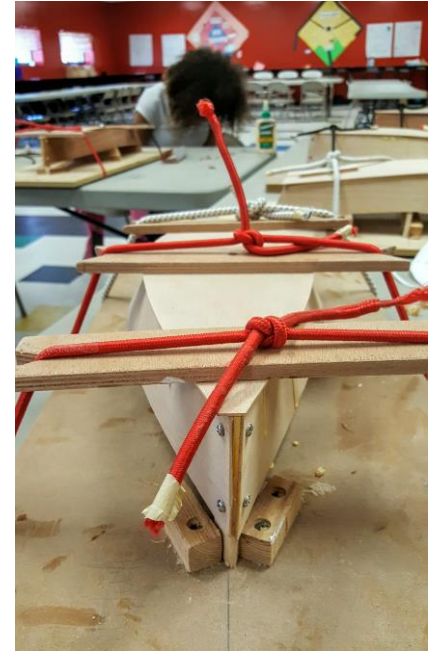


# Community Boating 2017, New Bedford

- 4-day intensive vacation week
  - Beginning with the cleats installed with center frames and transoms.
- 12-week all-girls middle school program .
  - 5<sup>th</sup> graders build in teams of 2 students, from kits, to “rowboat” model.
  - 6<sup>th</sup> graders build their own boats to “rowboat”.
  - 7<sup>th</sup> graders take their 6<sup>th</sup> grade hulls and continue to the pond version.
  - 8<sup>th</sup> graders completed boats they had begun the previous year and made them RC sailboats.

# Assessment

- Pre-test and post-test
  - STEM program
- Conferences and year on year growth
  - Boatbuilding program
- Daily vocabulary quizzes, and
- Independent observation by a school teacher
  - Middle school model boat building program





# Resources

- B2T Online Training
- Cardstock Model
- Seaworthy Small Ships  
Pinewood Sailer Model



BuildingToTeach Customize 4 New Edit Course Unit Howdy, Joe Youcha

**BUILDING TO TEACH** HOME ABOUT CASE STUDIES B2T BOOKS GET TRAINED TRAINING MATERIALS LOG OUT

Bevin's Skiff Models

09 Nov Bevin's Skiff Models  
Posted at 01:04h in by build029 • 0 Comments • 0 Likes

Much of the math that can be taught by building a full-sized boat can also be taught by building a model. The models range from a 1 hour cardstock model, to a 2 hour "pinewood sailor" model, to a plank on frame model that may take longer to build than the full-size boat.  
Please review the materials below and mark this unit as "complete."

[Bevin's Skiff Cardstock Model Pattern Page](#)  
[Bevin's Skiff Sailing Model Building Instructions](#)  
[Bevin's Skiff Cardstock Building Math Instructor's Guide](#)  
[Bevin's Skiff Sailing Pattern Pages](#)  
[Bevin's Skiff Instructions Classroom Handout](#)

Have you reviewed this material? If so, mark this unit as complete. [Mark as Completed](#)

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# Discussion Questions

What Design Changes have you made?