2018 Eastern Shore Boat Engineering Competition Scoring Rubrics

Design/Written Report

*Written report should thoroughly address each item with supported sources cited correctly using APA format. Reports **not following APA guidelines** will be assessed a **penalty of up to 5 points**. Resources for APA formatting can be found at: https://owl.english.purdue.edu/owl/resource/560/01/. The overall report should be ***no longer than 5 double spaced pages***. The boat drawings/designs are not included in this 5 page limit (submit as many detailed drawings/designs as deemed necessary). The written report should be submitted to tslove@umes.edu by ***April 6, 2018***.

Criterion	0	1	2	3	4
Government Regulation and Environmental Impacts of Boating	The report presents **little to no** information about positive **or** negative influences that the Department of Natural Resources (DNR) has on boating and the environmental impacts of boating on the Delmarva Eastern Shore.	The report **briefly** discusses **one** positive **or** negative influence that the Department of Natural Resources (DNR) has on boating and the environmental impacts of boating on the Delmarva Eastern Shore.	The report **vaguely** discusses **some** positive **and** negative influences that the Department of Natural Resources (DNR) has on boating and the environmental impacts of boating on the Delmarva Eastern Shore.	The report **thoroughly** discusses **some** positive **and** negative influences that the Department of Natural Resources (DNR) has on boating and the environmental impacts of boating on the Delmarva Eastern Shore.	The report **thoroughly** discusses **many** positive **and** negative influences that the Department of Natural Resources (DNR) has on boating and the environmental impacts of boating on the Delmarva Eastern Shore.
History of the Selected Boat Design	The report presents **little to no** information about the history of the boat design.	The report **briefly** discusses information about the history of the boat design.	The report **vaguely** discusses information about the history of the boat design.	The report discusses **some** of the information about the history of the boat design.	The report **thoroughly** discusses information about the history of the boat design.
Designs: Scaled 1”=1’-0”	**No** measurements were **accurately** scaled **or** provided for the necessary boat components.	**Few** measurements were **accurately** scaled and provided for **few** of the necessary boat components.	**Some** measurements were **accurately** scaled and provided for **some** of the necessary boat components.	**Most** measurements were **accurately** scaled and provided for **most** of the necessary boat components.	**All** measurements were **accurately** scaled and provided for **all** of the necessary boat components.

Science and Math Connections	Critical science concepts and a budget are **not** included.	Critical science concepts that contributed to the design and testing of the boat are **vaguely** described **without** pictures/ diagrams, **or** a description of how the items were used to design/ construct/test the boat is included.	Critical science concepts that contributed to the design and testing of the boat are described in **little** detail **with or without** pictures/ diagrams and sources cited. A budget plan is included but **missing one** of the following: price, quantity, or description of how the items were used to design/ construct/test the boat is included.	Critical science concepts that contributed to the design and testing of the boat are described in **some** detail **with** pictures/ diagrams and sources cited. A **broad list** with price, quantity, and description of how the items were used to design/ construct/test the boat is included.	Critical science concepts that contributed to the design and testing of the boat are described in **great** detail **with** pictures/ diagrams and sources cited. A **detailed/ itemized** budget plan with price, quantity, and description of how the items were used to design/ construct/test the boat is included.
Stability	X	Did **not** include any calculations, work, or pictures for determining the metacentric height of 3/4" or roll period of less than 2 seconds.	Included **inaccurate** calculations and work for determining the metacentric height of 3/4" or roll period of less than 2 seconds. Does **not** include pictures of testing this.	Included **inaccurate** calculations and work for determining the metacentric height of 3/4" or roll period of less than 2 seconds. **Includes** pictures of testing this.	Included **accurate** calculations and work for determining the metacentric height of 3/4" or roll period of less than 2 seconds. **Includes** quality pictures of testing this.

Total = ____/20

Boat Design and Construction

Criterion	2	3	4	5	6
Completed Product	No boat or an **incomplete** boat was brought to the event.	Boat required **major** modifications prior to the event. It had **no** resemblance to the boat described in the written report.	Boat required **minor** modifications prior to the event. It had **little** resemblance to the boat described in the written report.	Boat required **limited** modifications prior to the event. It had **some** resemblance to the boat described in the written report.	A completed boat was brought to the event and **no** modifications were required prior to the event. It had **all character-istics** resembling the boat described in the written report.
Paint	X	The boat was not painted **or** marked with a team name.	The boat was **carelessly** painted **or** the team name was not easily identifiable.	The boat was **adequately** painted **and** marked with an identifiable team name. The paint provided **little enhance-ment** the visual appeal of the boat.	The boat was **neatly** painted (no runs, etc.) **and** marked with an **easily** identifiable team name. The paint **greatly enhanced** the visual appeal of the boat.
Size Constraints	X	**None** of the following meet the required specifications : boat length, beam length, or hull.	**Two** of the following do not meet the required specifications : boat length, beam length, or hull.	**One** of the following does not meet the required specifications : boat length, beam length, or hull.	The boat meets **all** of the following specifications : beam is between 8-12”, length is between 24-40”, hull draft does not exceed 2” when empty.

Cabin	X	X	The cabin occupies **more/less** than 10% of the hull and **is not** 5" inches above the deck.	**One** of the following do not meet the required specifications : Cabin occupies 10% of the hull and is 5" inches above the deck.	The boat meets **all** of the following specifications : Cabin occupies 10% of the hull and is 5" inches above the deck.
Supply Basket Space	**No free space** is provided on the hull for the supply baskets.	X	At least **15%** of the hull length is free of supply baskets.	X	At least **35%** of the hull length is free of supply baskets.

Total = ____/30

Oral Report at Event

*Based on responses to judges questions at the event.

Criterion	1	2	3	4	5
Engineering Design Process (EDP)	Students **failed** to clearly explain how they went through **any** phases of the EDP to design, test, and troubleshoot their boat.	Students demonstrated **confusion** in explaining how they went through **some** of the EDP phases to design, test, and troubleshoot their boat.	Students provided **vague** explanations of how they went through **some** of the EDP to design, test, and troubleshoot their boat.	Students provided **clear** explanations of how they went through **all** phases of the EDP to design, test, and troubleshoot their boat.	Students provided **very detailed** explanations of how they went through **all** phases of the EDP to design, test, and troubleshoot their boat.
Application of Science and Math Concepts	Students **failed** to clearly explain how they applied **any** science or math concepts to design, test, or troubleshoot	Students demonstrated **confusion** in explaining how they applied science **or** math concepts to design, test, and	Students provided **vague** explanations of how they applied **some** science **or** math concepts to design, test,	Students provided **clear** explanations of how they applied **some** science **and** math concepts to design, test,	Students provided **very detailed** explanations of how they applied **multiple** science **and** math concepts to design, test, and

	their boat.	troubleshoot their boat.	and troubleshoot their boat.	and troubleshoot their boat.	troubleshoot their boat.
Presentation Skills	Students demonstrated **very little if any** knowledge of STEM/ boating concepts to answer the judges' questions **or** used resources. Students **rarely** displayed an upright posture, made eye contact with the judges, and projected their voice.	Students demonstrated **limited** knowledge of STEM/ boating concepts to answer the judges' questions **or** used resources sparingly. **Sometimes**, students displayed an upright posture, made eye contact with the judges, and projected their voice.	Students demonstrated **average** knowledge of STEM/ boating concepts to answer the judges' questions while using no resources. **At most times**, students displayed an upright posture, made eye contact with the judges, and projected their voice.	Students demonstrated **adequate** knowledge of STEM/ boating concepts to answer the judges' questions while using no resources. **At all times**, students displayed an upright posture, made eye contact with the judges, and projected their voice.	Students demonstrated **exceptional** knowledge of STEM/ boating concepts to answer the judges' questions while using no resources. **At all times**, students displayed an upright posture, made eye contact with the judges, and projected their voice.

Total = ____/15

Performance Demonstrations

Criterion	2	4	6	8	10
Boat Navigation	**Poor/limited** boat control, resulting in the vessel striking other objects or boats on **5 or more** occasions.	**Below average** control, resulting in the vessel striking other objects or boats on **4-5** occasions.	**Average** control, resulting in the vessel striking other objects or boats on **2-3** occasions.	**Above average** control, resulting in the vessel striking other objects or boats on **one** occasion.	**Exceptional** control, **never** allowing the vessel to strike other objects or boats.
Speed Competition	**9th or 10th** point ranking.	**7th and 8th** point ranking.	**5th and 6th** point ranking.	**3rd and 4th** point ranking.	**1st and 2nd** point ranking.
Rescue Competition	**9th or 10th** lowest time with raft in tact.	**7th and 8th** lowest time with raft in tact.	**5th and 6th** lowest time with raft in tact.	**3rd and 4th** lowest time with raft in tact.	**1st and 2nd** best lowest time with raft in tact.

	1	2	3	4	5
Boat Integrity	Boat **failed to complete** the competition.	Boat **failed to complete t**he competition **still in one piece**.	Boat **completed** the competition while incurring **some** significant damages.	Boat **completed** the competition in tact while incurring **very minor** damages.	Boat **completed** the competition in tact while incurring **no** significant damages.

Total = ____/35

TOTAL SCORES

Design/Written Report ____/20

Boat Design & Construction ____/30

Oral Report ____/15

Performance Demonstrations ____/35

Grand Total ____/100

Awards

- Best design/written report
- Speed Competition: Most Points
- Rescue Competition: Lowest Time
- Highest Overall Rubric Score
- Sportsmanship/Team Spirit Award