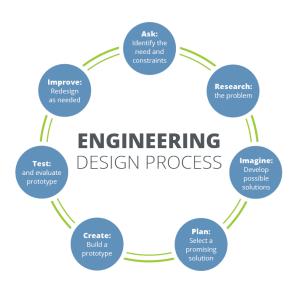
Name:	Date:	Class:	

Engineering Notebook



Driving Question: How can properties of matter and geometric design be incorporated in the manufacturing process to make a better smartphone case?

Engineering Design Challenge: Design a better smartphone case considering properties of materials, needs of users with (i.e. weight, strength, etc.), desires of users (preferred design), and cost. Below are the expectations.



Name:	Date:	Class:
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Smartphone Case Expectations

Category	
Design	The smartphone case is creative and the design fits the needs of the user including being a shape of desired strength.
Lightweight	Weight is not a concern for the user.
Strength	Smartphone case protects model phone after 5+ drop tests from 2 meters.
Cost Effectiveness	Smartphone case is cost effective.
Material Properties	Team understands how properties affect how we use materials as it is related to materials engineering. Students identified needs and used a creative combination of materials or a specific material to address the needs of the user.

Name:	Dat	te:	Class:

Smartphone Case Project Rubric

	Smartphone Case Project Rubric				
Category	4	3	2	1	
Design	The smartphone case design fits all of the needs desires of user. Design was inviting and creative and innovative.	The smartphone case design fits some needs. Design was somewhat creative/innovative.	The smartphone case design fits few of the needs. Little creativity was shown in the design.	The smartphone case design fits one or none of the needs. No creativity was shown.	
Lightweight	Weight is not a concern for the user.	Weight becomes a concern of the user long period of time or when carrying lots of other items.	Weight of smartphone case becomes a concern after a short period of time.	Smartphone case weight is not practical.	
Strength	Case protects model phone after 5+ drop tests.	Case protects model phone after 3+ drop tests.	Case protects model phone after 1+ drop tests.	Case protects model phone after 0 drop tests.	
Cost Effectiveness	Smartphone case is cost effective.	Smartphone case has a relatively low cost but changes could be made to decrease the cost.	Smartphone case design was expensive for the case created.	No relation was made between materials used and cost. Product is too expensive.	
Material	All team members	Some team members	One team member	No member showed	
Properties—	showed a superior	showed a superior	showed a superior	a superior of	
Material	understanding of	understanding or all	understanding and	chemical and	
Science	chemical and	showed basic	some showed basic	physical properties	
Engineering	physical properties and how they influence materials used when creating products. Each was able to show/explain why chosen materials were ideal for this product when asked throughout the project.	understanding of chemical and physical properties and how they influence the materials used when creating products. One or two were able to demonstrate why chosen materials were ideal for this product when asked throughout project.	understanding of chemical and physical properties and how they influence the materials used when creating products. Some were able to demonstrate why chosen materials were ideal for this product.	and how they influence materials used when creating products. Some were able to show/explain why chosen materials were ideal for this product when asked throughout the project	
Engineering	All team members	Some team members	One or two team	No team members	
Design	showed mastery	showed mastery	members showed	showed mastery	
Process	understanding of the engineering design process.	understanding of the engineering design process.	mastery understanding of the engineering design process.	understanding of the engineering design process.	

Na	me:	Date:	Class:
	Noteboo	ok Questions	
Answei	r as instructed.		
1.	What properties are needed in a useful smartpho	ne case?	
2.	Provide a <u>basic</u> labeled sketch of your team's sma	artphone case design.	
		,	
3.	Explain what materials you plan to use. Why? Di	scuss their chemical and	physical properties
٥.	Explain What materials you plain to user Why. Br	seass their enermear and	priyordar properties.
1	List the materials and their costs as you build you	ır nrototyna	
4.	List the materials and their costs as you build you	ii prototype.	
5.	Before testing, weigh your case. Record the mass	s of your case here.	
٥.	before testing, weight your case. Record the mast	, or your case herer	
6.	Drop Test Results: How many drop tests did your		e case damaged? Was the "phone
	damaged? Describe. What changes are you consider	dering?	

Name:		Date:	Class:
Team Name	Team Members:	Scaled Drawing	
	Period		
			ll
		o scale. (Reminder, this means belowith colors and create a ke	including proper measurements.) y.