CLASSIFIEDPROPERTY OF THIRD EYE**

Failure #2 Investigation Log (SIDE 1)

TEACHER KEY

This key provides suggested answers, but students might not write about everything mentioned here—or they might have additional ides, which is great!

File	Summary	How did this contribute to the supersuit's failure?
Video	*Monet says that this suit was an ArmorSuit designed for the shivelers who were hunting the kids in the TimeTilter. But the suits failed and the shivelers had terrible experiences.*	
Audio Clip (Interview with Shivelers)	*The supersuits were so clunky and heavy that they slowed the shivelers down and made them fall.* *Rainwater got into the suits and added to the weight.* *The shivelers ended up with severe exhaustion, bruising, and hypothermia.* *The shivelers said no one asked for their input.*	*The engineers didn't talk to the shivelers to find out how the suits would be used—so they ended up using a material that was too heavy.*
Shiveler Employment History	*The logbook mentions shiveler reports of muscle aches, joint pain, bruising, and shortness of breath.*	*Shivelers were fired for providing feedback about design issues and lack of communication.* *No one used the shivelers' feedback to improve the design of the suit.*
Collusia Text Log	*The engineers chose a material based mostly on it strength and resistance to heat and corrosion.* *The engineers were under pressure to keep costs down.*	*The engineers didn't have access to users to talk about their needs, so they didn't know how important it was for the suit to be lightweight.* *Because of the pressure to keep costs down, the engineers went ahead without optimizing their design.*
Armor Suit Blueprints	*The blueprints confirm that the final choice of material for the suit was based mostly on strength and cost.*	*The suit was not optimized by testing different materials and getting user feedback.*

Collusia Poster	*The poster shows the steps of the engineering design process*	*The poster shows that the engineers knew about the importance of optimization, but they skipped this step because they were told to keep costs down.*

CLASSIFIEDPROPERTY OF THIRD EYE**

Failure #2 Investigation Log (SIDE 2)

CONCLUSIONS:

What went wrong with choosing the materials for the suit? What could the engineers have used instead?

The material that the engineers chose (stainless steel) was too heavy. They might have been able to use glass fiber, which is strong and less dense than stainless steel—and not much more expensive. which isn't a lot more expensive than stainless steel according to the table, but is stronger and less dense. Unfortunately, glass fiber is also somewhat less heat-proof. Titanium is slightly more expensive but is as strong and heat-proof as stainless steel.

Why did things go wrong? (Think about how the team used the engineering design process.)

The engineers didn't talk to the users (the shivelers) and find out about their needs—so they didn't have enough information to optimize (improve) the suit. The engineers were also under pressure to keep their costs down.

What could ThirdEye do differently?

ThirdEye could research materials more carefully. They could also talk to people who are going to use the suit to find out what their needs are. And they could get feedback from users to find out about any problems and optimize their design. They could try to balance the cost of the suit with a design that meets user needs and keeps them safe.