Requirements

1. The cost of building material should not surpass $250.00
2. Diagnostic accuracy should be greater than or equal to 85%
3. Easy for an individual to understand and operate and doesn’t require a lot of work.
4. The device attached to the phone must be less than 200 grams.
5. The device attached to the phone must be less than 15.7 centimeters (length of an average mobile phone) long.
6. The device should be visually appealing and have a sleek design. There should be no wires or other technical components sticking out.
7. The device should be easily constructable by an individual in the general population given instructions. No advanced technical/scientific knolwedge should be required for construction.
8. An individual should be able to easily read and interpret the results of their diagnosis. The outputted tesults should not leave any room for confusion.
9. Similar instrumentation in which the prototypes are built off of should have been received positively by the general public.
10. All aspects of the device sould be durable and not break or damage easily. The device should be made of strong material (plastic, wood, etc).
11. The individual should be able to easily go through the entire proccess of diagnosis with little to no chemistry and technical knolwedge.

Requirements	Weight	Papercraft Spectrometer (Sketch #1)	Smartphone Spectrometer (Sketch #2)	Grating Spectrometer (Sketch #3)
Cost friendly materials: Doesn't require a lot of money to attain/produce the materials. *Justification: This product is a cost-friendly alternative that can serve those in low income communities who are at a financial disability.*	**7**	**8**	**6**	**7**
Accurate display of results: The user is given clear and understandable results that are CORRECT. *Justification: The accuracy display is important because it gives the user a clear depiction of the results.*	**10**	**10**	**10**	**10**
Convenient to use: Easy for the user to understand and operate and doesn't require a lot of work. *Justification: This product is meant to be used casually in a way that users can utilize on the spot. This is not meant*	**7**	**7**	**8**	**8**

to be advanced or a lengthy process.				
Portability: Easily transportable and can be carried. *Justification: Allows users to use this device anywhere and easily detect malaria wherever they go.*	**7**	**10**	**9**	**7**
Visually appealing: Comprehensive appearance that doesn't overwhelm the user. *Justification: Doesn't attract attention. Also a simple design that doesn't distract or confuse the user.*	**3**	**7**	**9**	**8**
Easy to DIY: Ability for users to create themselves. Doesn't require complicated machinery to attain parts. Further works for this project could include on top of manufacturing this device, allowing users the ability to make it themselves by providing them with the basic materials and files. *Justification: Since we are targeting those in*	**6**	**10**	**7**	**5**

lower income communities, they may not have access to the equipment that is needed to create the parts. Ex. 3D printer				
Ability to read samples: The spectrometer can accurately read and analyze the given samples. *Justification: The accuracy of the analysis and ability to read the samples is important because malaria is a serious disease that should be combated as much as possible. This starts with being able to accurately identify it.*	**9**	**10**	**10**	**10**
Prior reviews: The spectrometer model has positive feedback and approval/proof that it works for other customers. *Justification: This gives a general estimate on customer satisfaction and if this model has a history of working well.*	**5**	**7**	**8**	**7**
Durability: The spectrometer is not easily breakable and can	**6**	**5**	**8**	**7**

withstand some amounts of force. *Justification: The device should not break easily because that is very inconvenient for the users.*				
No prior spectroscopy knowledge: The spectrometer does not require extensive knowledge on spectroscopy to operate it. It can be used without a former background in the area. *Justification: This device is for low income communities who might not have access to resources on spectroscopy or the educational background required to operate complex devices.*	**8**	**9**	**8**	**7**
Total:		**583**	**572**	**531**

Justifications

This product is a cost-friendly alternative that can serve those in low income communities who are at a financial disability.

The accuracy display is important because it gives the user a clear depiction of the results.

This product is meant to be used casually in a way that users can utilize on the spot. This is not meant to be advanced or a lengthy process.

Allows for the user to be able to carry the device with ease

Allows users tthe ability to store the device without having to carry it everywhere

Doesn't attract attention. Also a simple design that doesn't distract or confuse the user.

Since we are targeting those in lower income communities, they may not have access to the equipment that is needed to create the parts. Ex. 3D printer

The accuracy of the analysis and ability to read the samples is important because malaria is a serious disease that should be combated as much as possible. This starts with being able to accurately identify it.

This gives a general estimate on customer satisfaction and if this model has a history of working well.

The device should not break easily because that is very inconvenient for the users.

This device is for low income communities who might not have access to resources on spectroscopy or the educational background required to operate complex devices.