
Introduction to Design

ME EN 4000 Engineering Design I Topic 1



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Good vs. Bad Design

Good Design	Bad Design
Meets all technical requirements	Meets only some technical requirements
Works all the time	Works initially but stops working after a short time
Meets all cost requirements	Costs more than it should
Requires little or no maintenance	Requires frequent maintenance
Is safe	Poses a hazard to users
Creates no ethical dilemma	Raises ethical questions

Source: Horenstein M, *Design Concepts For Engineers*



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Meets all technical requirements

Snowboard Bindings

FR: Works under all conditions, including snow sticking to the bottom of the boot



Strap: Yes – straps are adjustable



Step-in: No – increased height will prevent clams from locking



(FR = Functional Requirement)

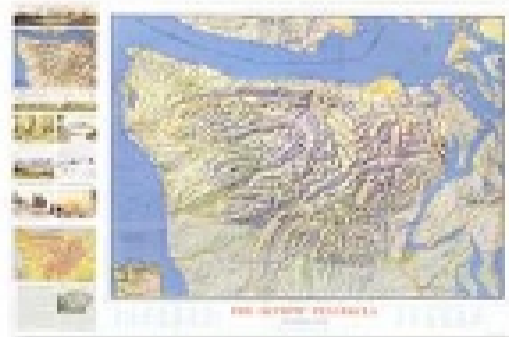
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Source: Burton

3

Works all the time

Navigation



Compass + Map: Yes



GPS: No (dead batteries, satellite shutdown)



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Source: REI

4

Meets all cost requirements

Writing in zero gravity



NASA space pen: Development cost 1-2 m\$



Russian Cosmonauts:
A Pencil

Source: Thewritersedge.com

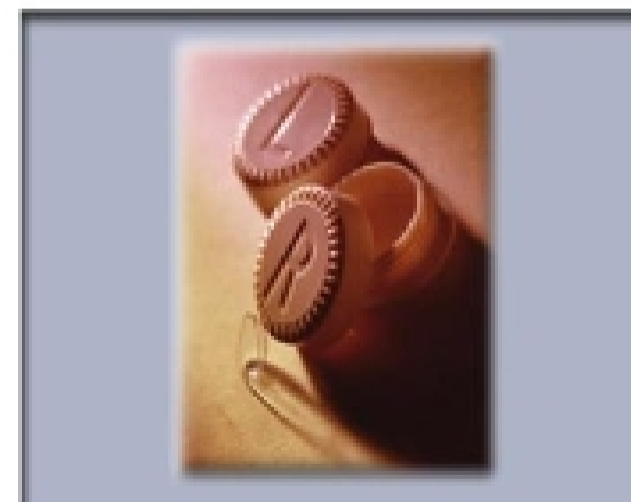


Requires little or no maintenance

Cleaning of Optics



Glasses: Lens cloth



Contacts: Clean **and** store in
special solution

Source: Lenscrafters

