Basic Systematic Materials Selection

Note Handout

Lesson 1: the Design Process

Sketch the design process as introduced in this lesson

What stage of the design process would include simulation to explore various elements of the design?

What level of materials data do you need at the concept, embodiment, and detail phases? Add notes to your sketch above

Lesson 2: Materials Selection Methodology

Sketch the materials selection methodology

Match the translation category with it's definition:

Function	The geometry and loading condition of the component being design; its overall purpose
Free-Design Parameters	Essential conditions that must be met in order for the part to function
Constraints	Performance metrics that must be optimized in order for the component to function as intended
Objectives	An element of design that can be altered to accommodate various material choices

What would be a constraint when selecting your dream car? Does it match Kaitlin's?

Lesson 3: Applying Constraints and Objectives

What is ranking and how is it used for materials selection?

What is screening and how is it used for materials selection?

What functions are used in Granta EduPack to perform screening? How about to perform Ranking?

Lesson 4: Case Study- Materials Selection for a Heat Sink

Where can simulation fit into the selection methodology?

What are the constraints and objectives for the materials selection of the heat sink?

Why is it difficult to find a material with high thermal conductivity but low electrical conductivity?