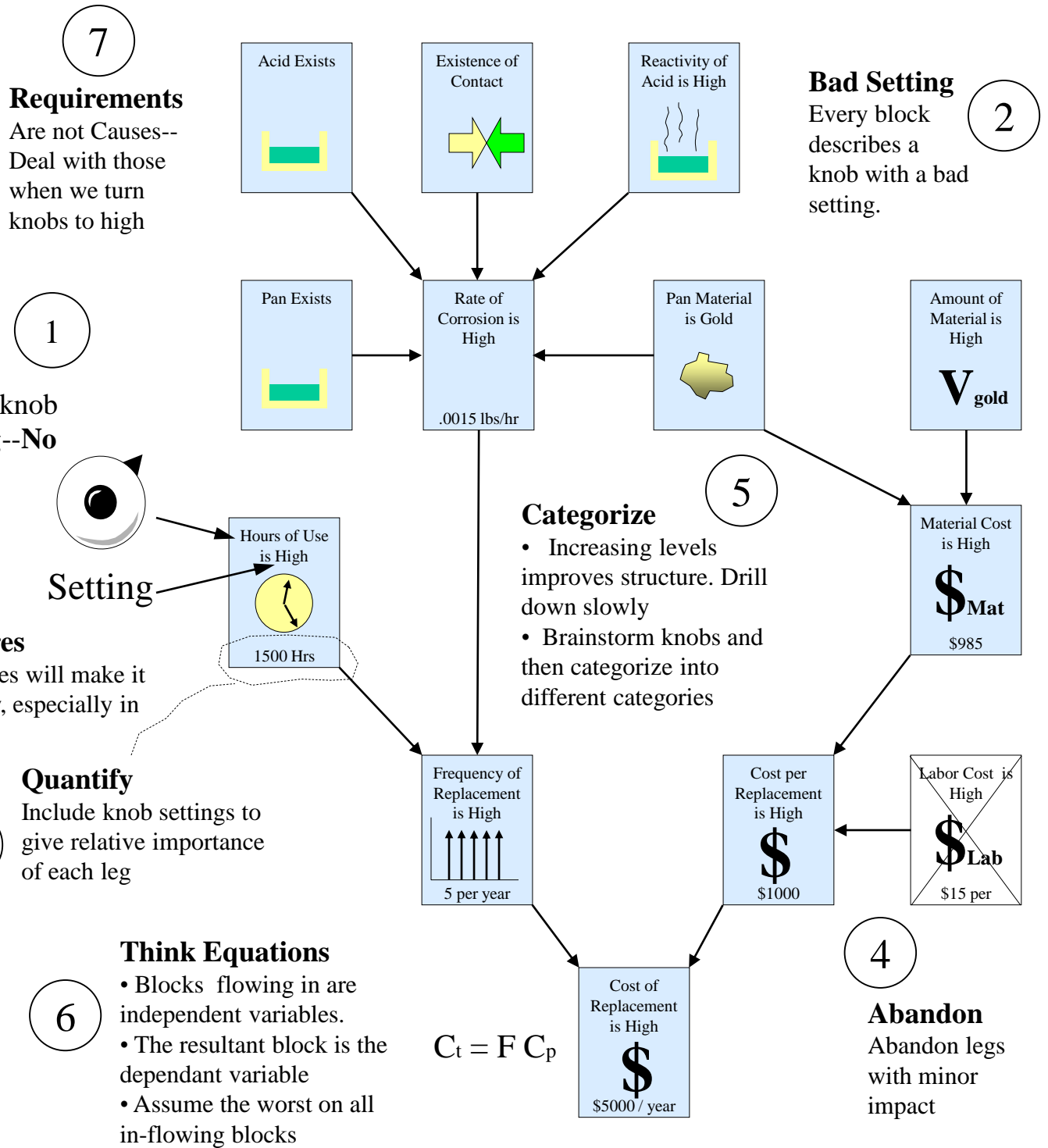
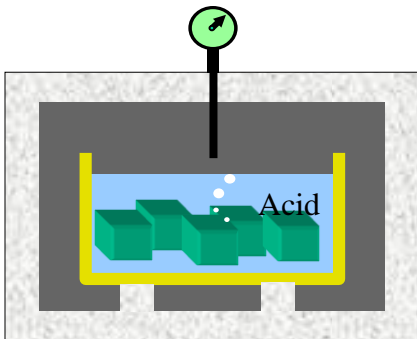


Cause-Effect Chain Rules

Identify knobs and Settings Leading to the Main Disadvantage

Cubes are placed in warm acid to investigate the effect of various acids on the cubes. Unfortunately, the container that holds the acid and cubes is corroded. The container is made from a gold and is very expensive to replace. Because the acid is so reactive and the test is performed often, the pan must be replaced frequently.



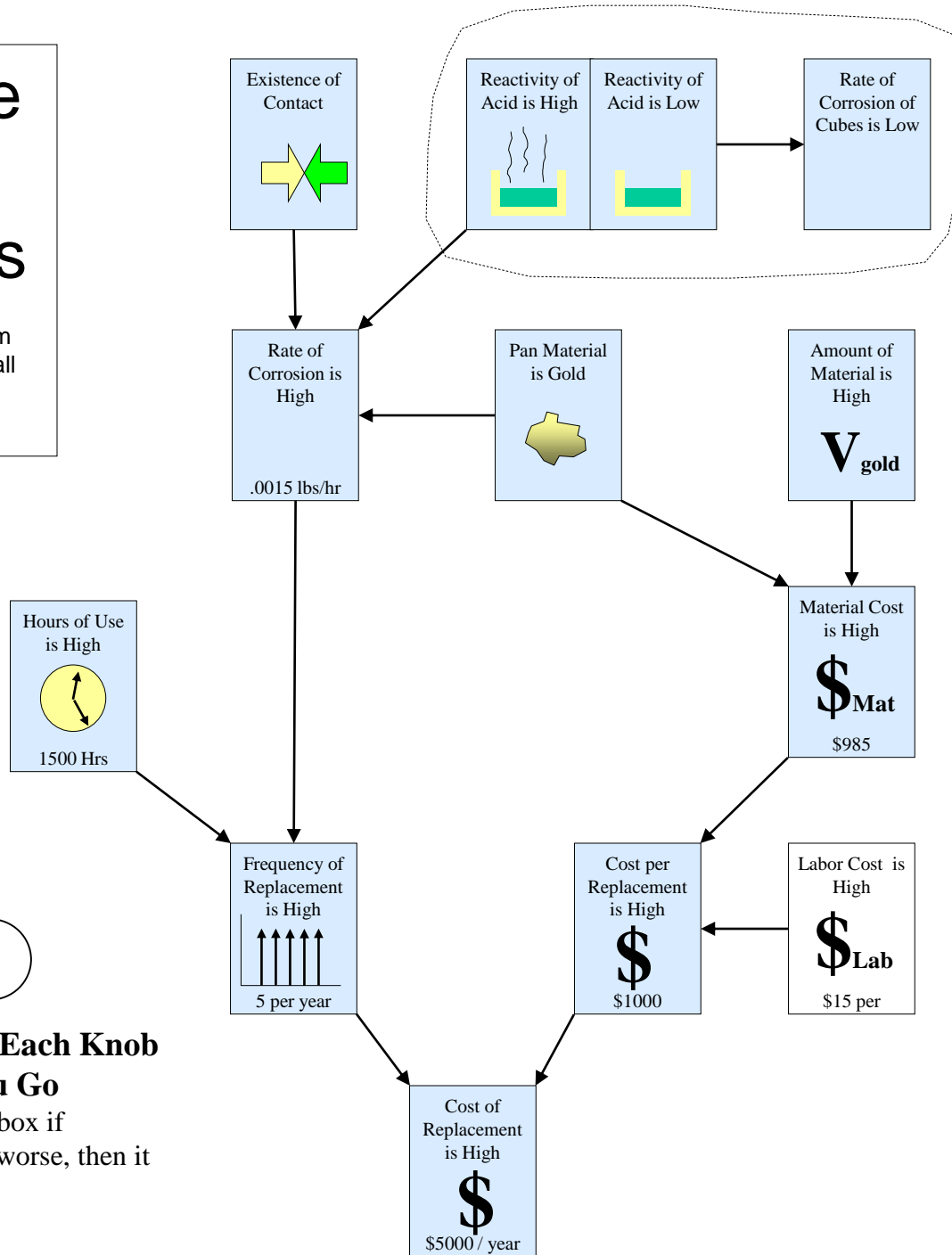
Alternative Problem Path Rules

Develop alternative problem paths, allowing one to see all sides of the problem

1

Try Turning Each Knob as You Go

Consider every box if something gets worse, then it is a requirement



2

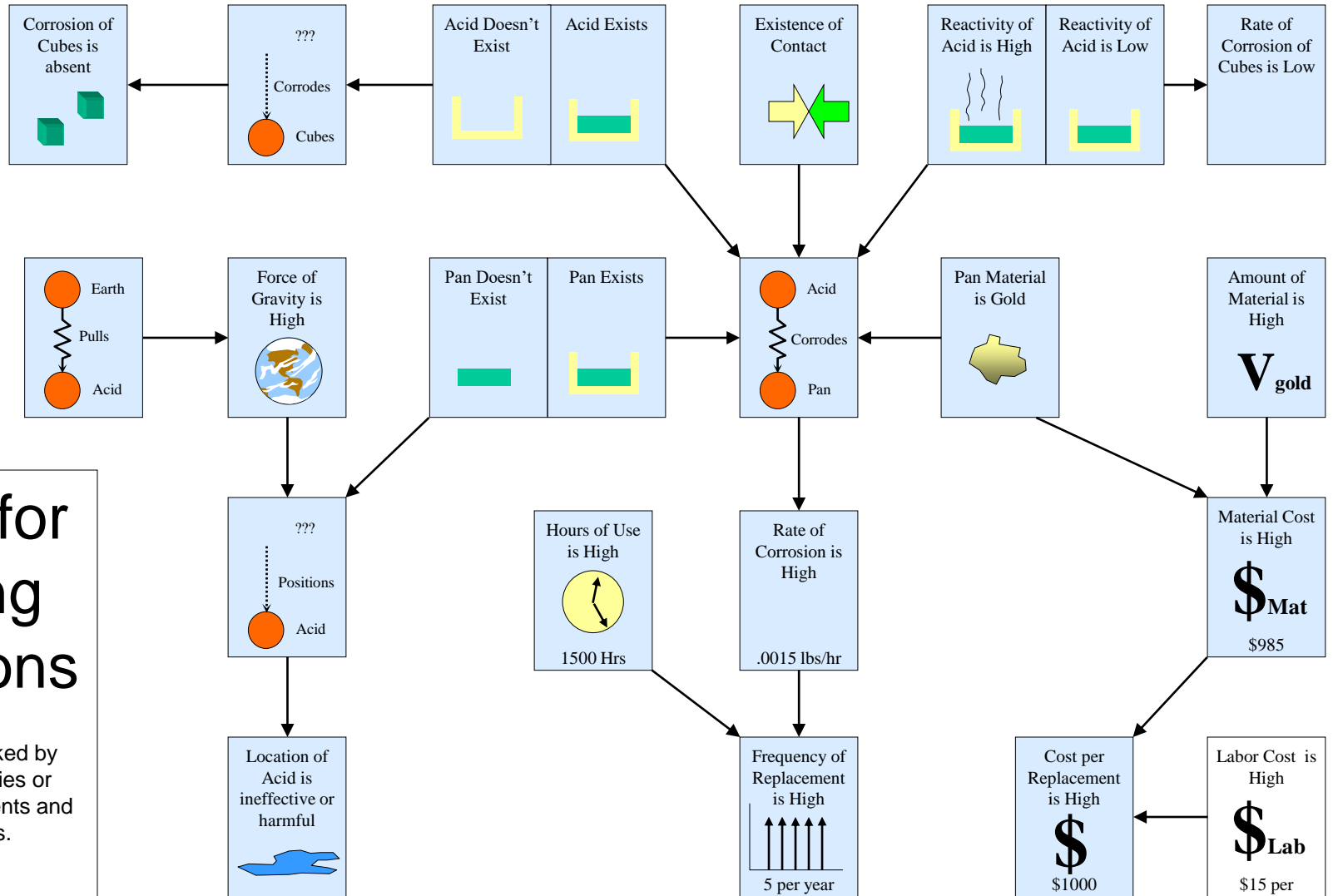
Requirements --Something Else Gets Worse
Some Knobs cause a problem when turned--- **Easy to Spot Contradiction**

3

Develop Alternate Problem Paths
---(There may be several)

1

- Look for object knobs caused by a function
- Not design features
 - Not set or constant
 - Are changed or controlled by something
 - Caused by an interaction with something else



Rules for Linking Functions

Functions are linked by features, properties or knobs of the elements and modifications.

2

Write the function. Be careful that it is described properly

3

Outputs of Functions: Why are **Elements** required-- What happens if they do not exist?

4

Why are **Modifications** required?--Consider Existence and Non Existence of the Modification

Cost of Replacement is High
\$5000/year

