

Let's play! Ludic pedagogy in a quants classroom

(or)

Low Tech **Ludic Pedagogy** Ideas for High Tech Times

Dr. Trent Tucker • TRU Gaglardi

ttucker@tru.ca

9:00 Welcome / Introduction / what is “Ludic” pedagogy?

9:10 Ludic Elements I • the escape room

9:25 Ludic Elements II • the versatile LEGO truck

9:40 Ludic Elements III • roll the bones

9:55 Design Sprint – Build Your Own Ludic Experience

10:25 Final Q&A / Wrap-up



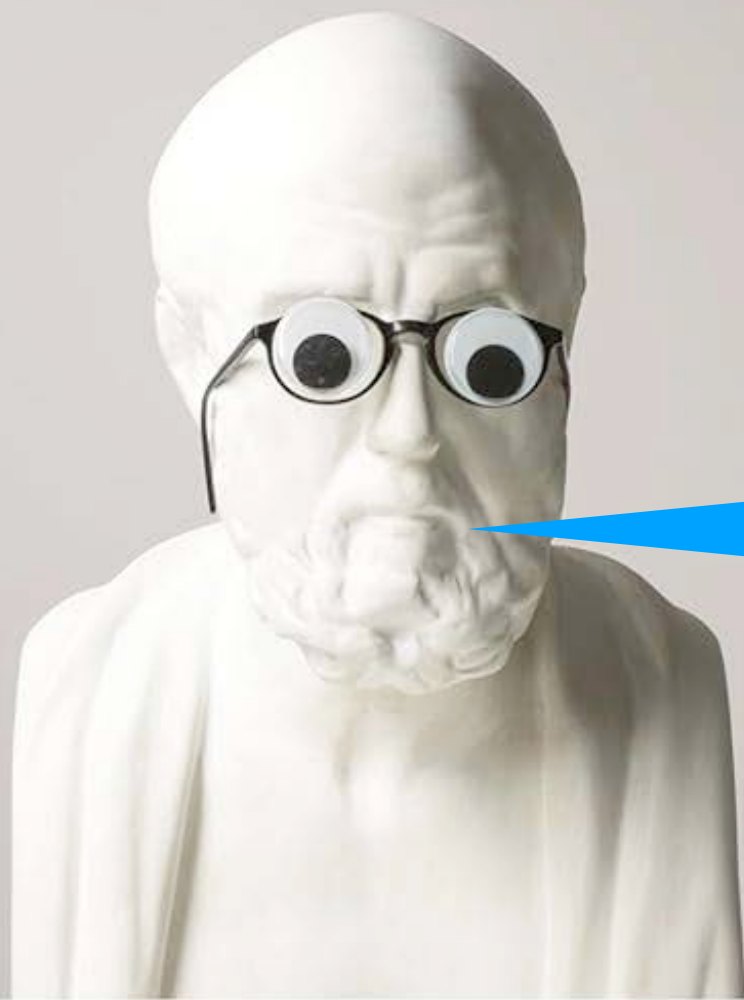
Artificial Intelligence is one of the most **exciting, transformative, profound, disruptive, over-hyped, misunderstood, underestimated, and misleading** technologies to come along in decades.

OEB.global • Berlin • 2025



Learning happens when you overcome something difficult – when you experience “friction”.

AI is frictionless 🤨



Ludic Pedagogy...

...is a pedagogical approach based upon four elements that are often hard to find in university classroom: fun, play, playfulness, and positivity.

LUDIC PEDAGOGY

A SERIOUSLY FUN WAY TO
TEACH AND LEARN

SHARON LAURICELLA and T. KEITH EDMUNDS

Welcome to my Office



ttucker@tru.ca

The Problem...

Q1-1: What Is an Information System?

- A system is a group of components that interact to achieve some purpose
- An **information system (IS)** is a group of components that interact to produce information
- Five fundamental components of computer-based information systems are:
 1. Hardware
 2. Software
 3. Data
 4. Procedures
 5. People



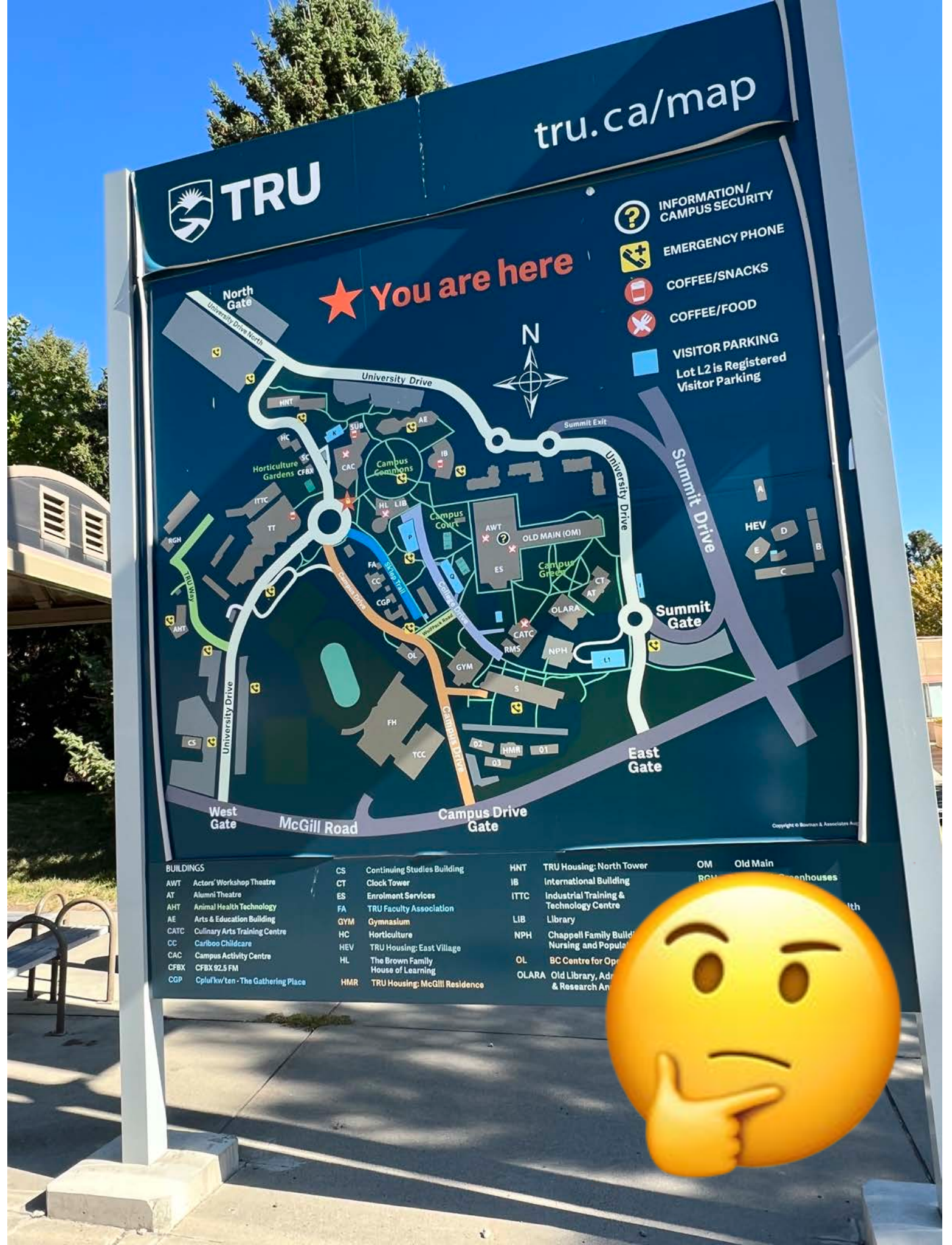
Pre
Class
Prep

MIST
2610

Other Elements

use improv ideas, silly hats, getting students out of their seats...

First Day
Of Class
Photo Shoot



Pre
Class
Prep

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Other Elements

use improv ideas, silly hats, getting
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of Class
Photo Shoot



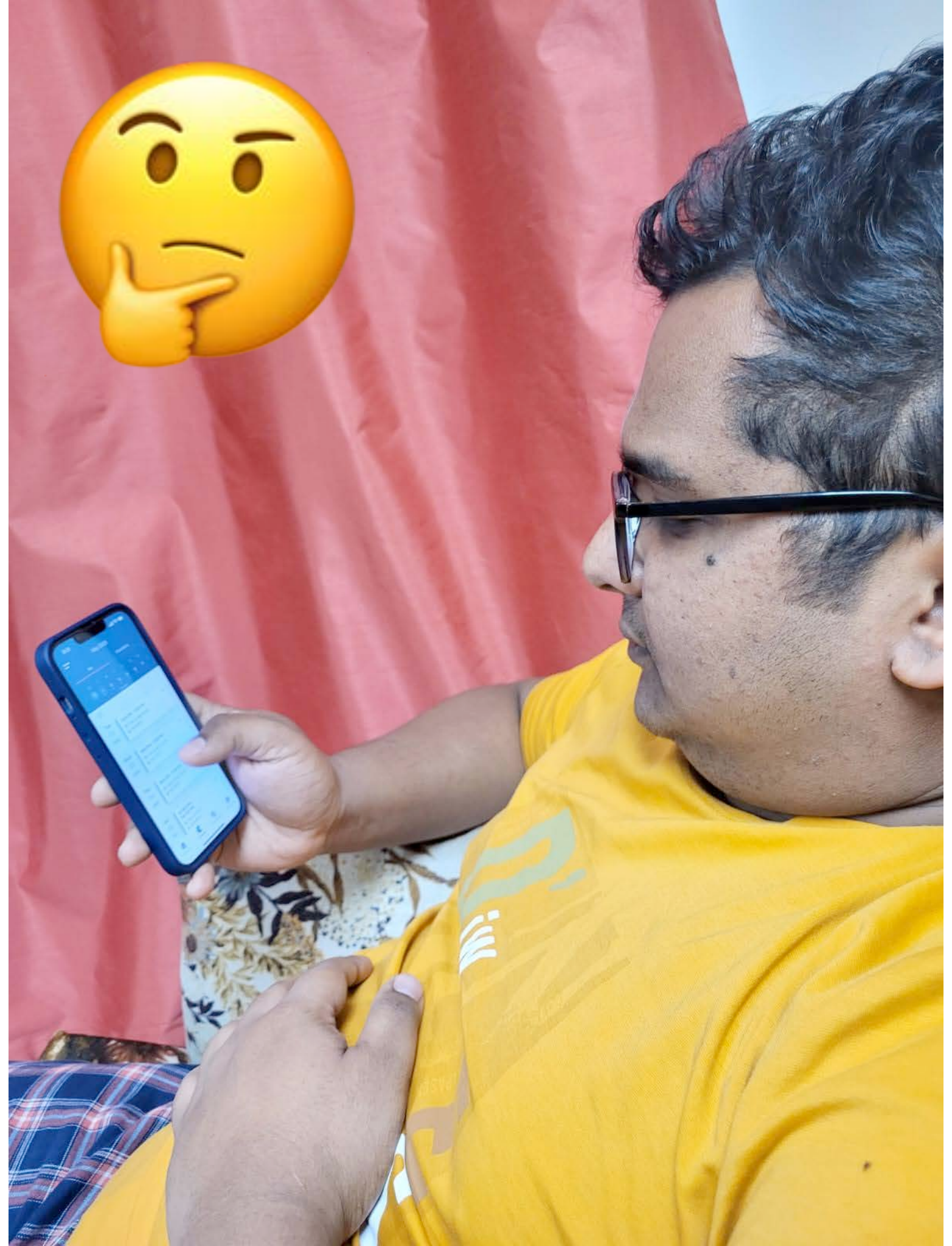
Pre
Class
Prep

MIST
2610

Other Elements

use improv ideas, silly hats, getting
students out of their seats...

First Day
Of Class
Photo Shoot



The Problem...

Traditional versus Agile Methods

- **Traditional Project Management Approach**
 - Concentrates on thorough, upfront planning of the entire project.
 - Requires a high degree of predictability to be effective.
- **Agile Project Management (Agile PM)**
 - Relies on incremental, iterative development cycles to complete projects.
 - Is ideal for exploratory projects in which requirements need to be discovered and new technology tested.
 - Focuses on active collaboration between the project team and customer representatives.



In
Class
Intro

BUSN
6070

Building Element

use LEGO, card stock & crayons, or
other elements to build something...

Easter Egg
Colouring
& Cutting





Traditional
Project Mgmt

Agile
Project Mgmt

□ YLO 9 | 13

□ RED 3 | 15

□ BLU 8 | 21

□ GRN 10 | 15



GRN

BLU

RED

Traditional
Project Mgmt

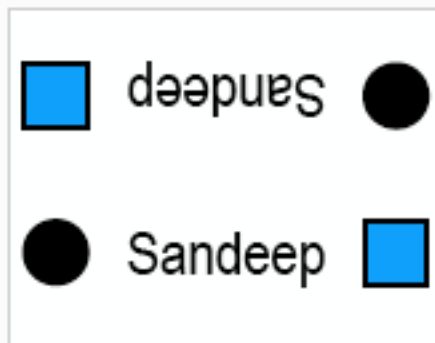
Agile
Project Mgmt

5 | 28

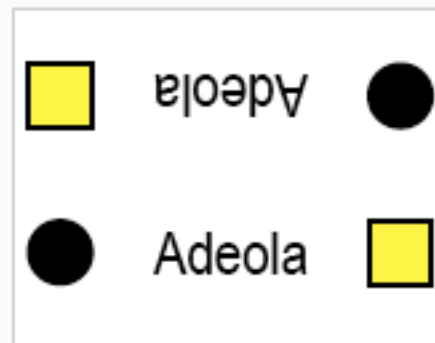
10 | 33

5 | 20

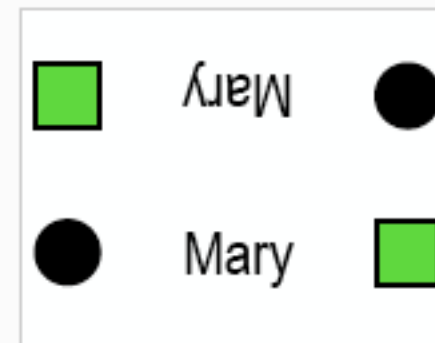
Sidebar...



6



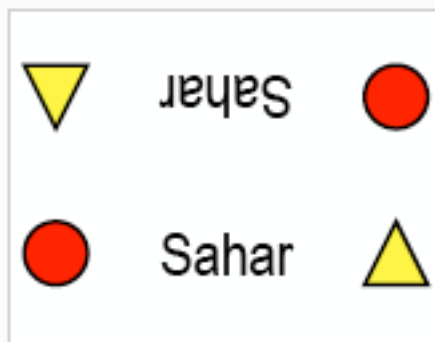
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8



9



11



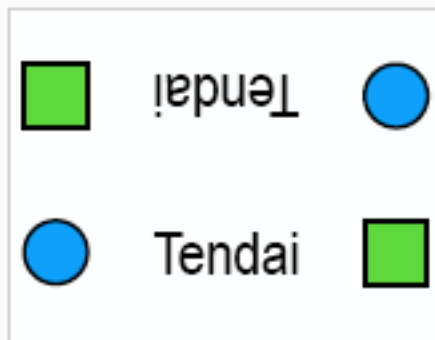
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13



14



16



17



18



19

Ludic Elements I

the escape room



38:47

TIME REMAINING

TEAMWORK
THINK CRITICALLY
COMMUNICATE
ESCAPE TOGETHER

CLUE 3:

Numbers hold the key,
but order sets you free.

7, 3, 8, 1, 6

THINK.
SOLVE.
ESCAPE.

CLUE 1

The first step is
not the beginning.
The end is not the end.
Find the balance
and you will transcend.



E	S	B	B	2
B	B	B	B	B
3	B	B	S	U
B	B	B	3	B
B	B	2	B	2
2	B	1	2	X

LEGO my Simplex*

Figure 1 The Available Resources^{a, b}

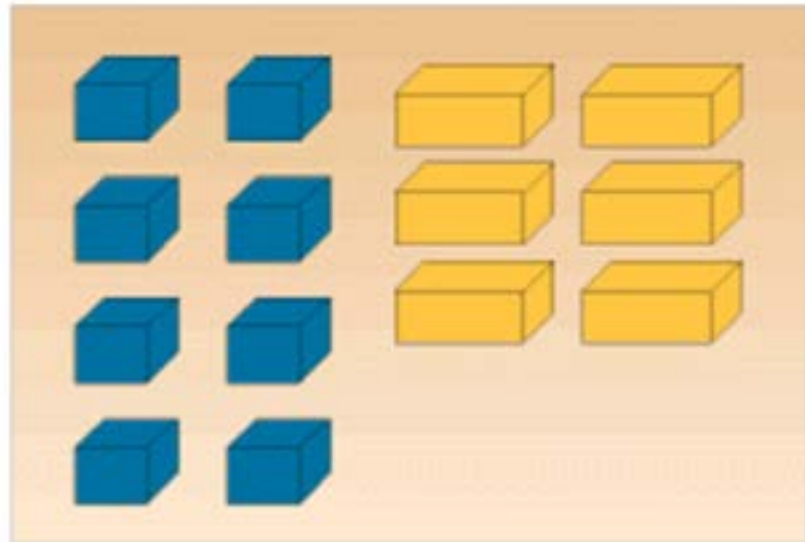


Figure 2 Construction of Tables and Chairs Using the Available Resources

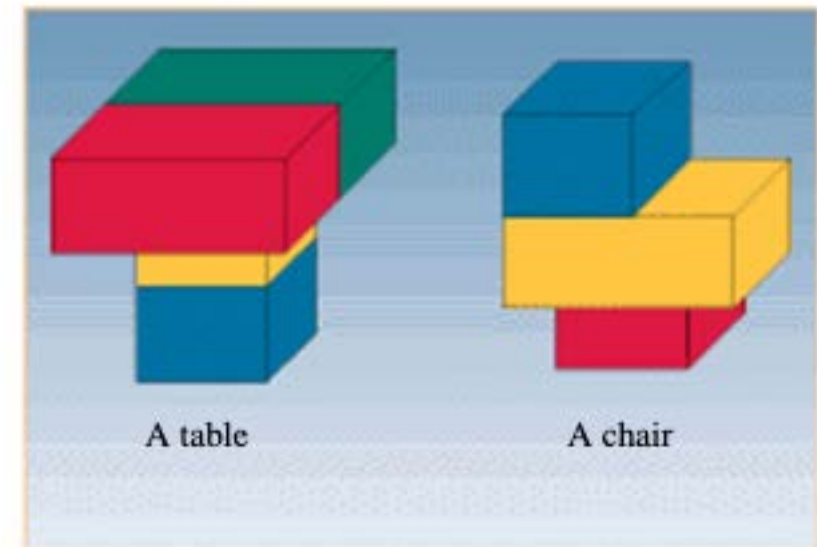
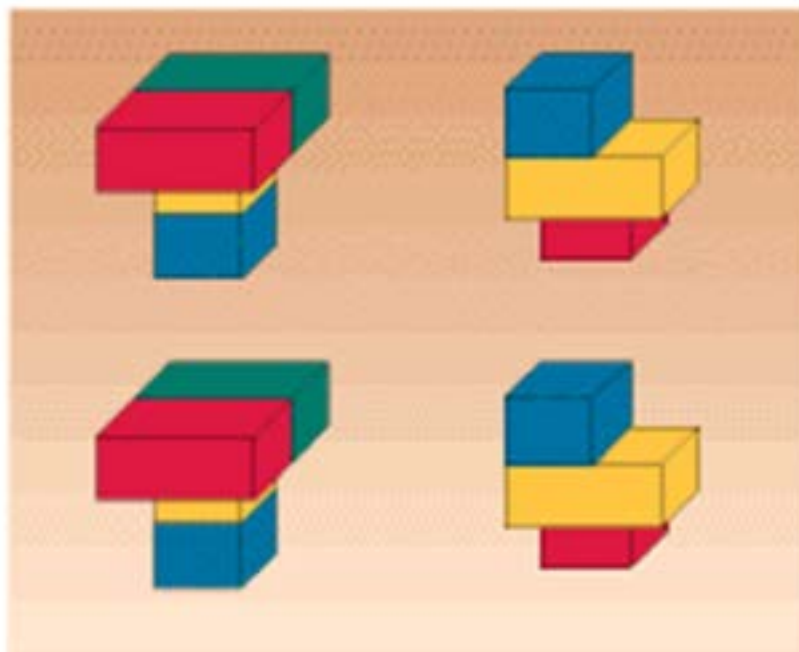


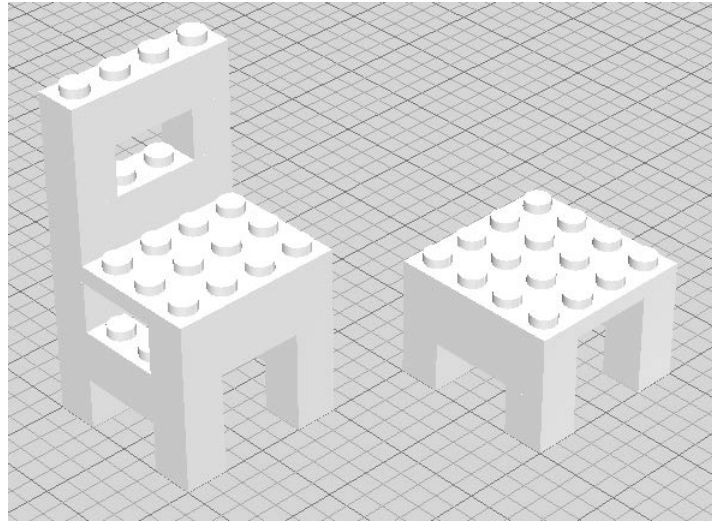
Figure 3 The Optimal Solution



*Pendegraft N (1997) *LEGO of my simplex*. ORMS Today 24(1):8.

The Monochromatic Furniture Company

The following is an extension of “LEGO my Simplex” [Pendegraft (1997) ORMS Today 24(1):8].

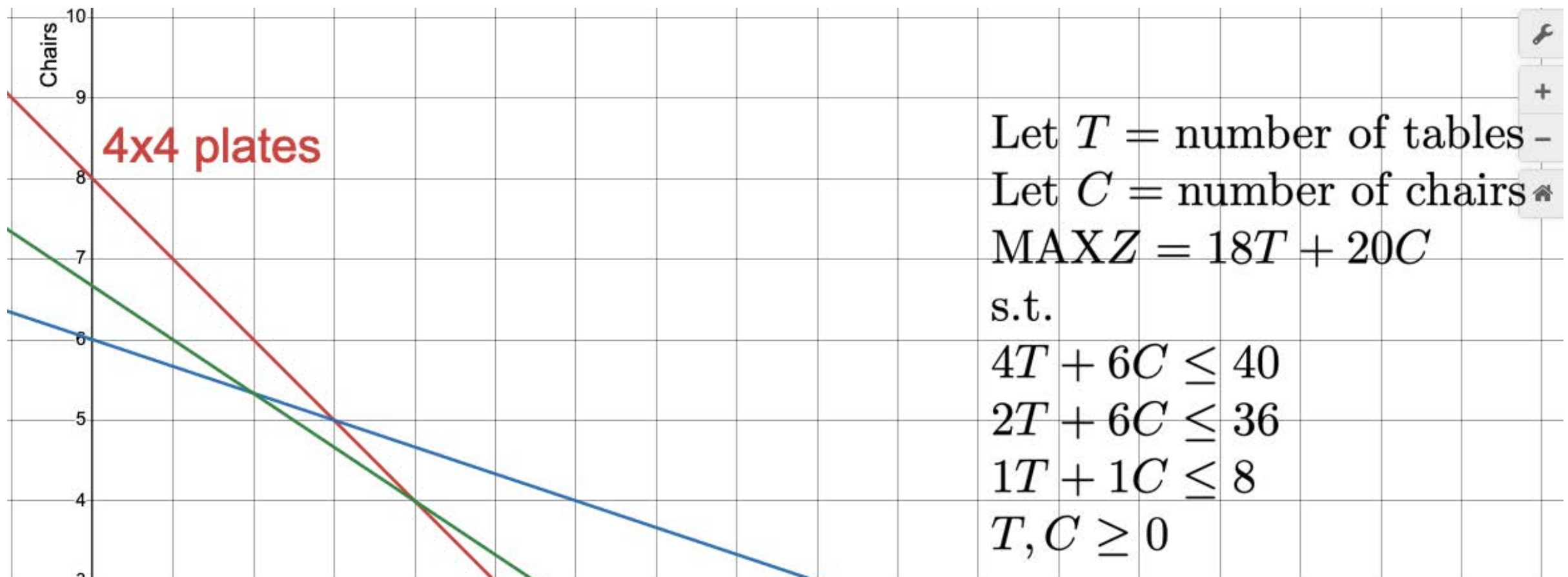


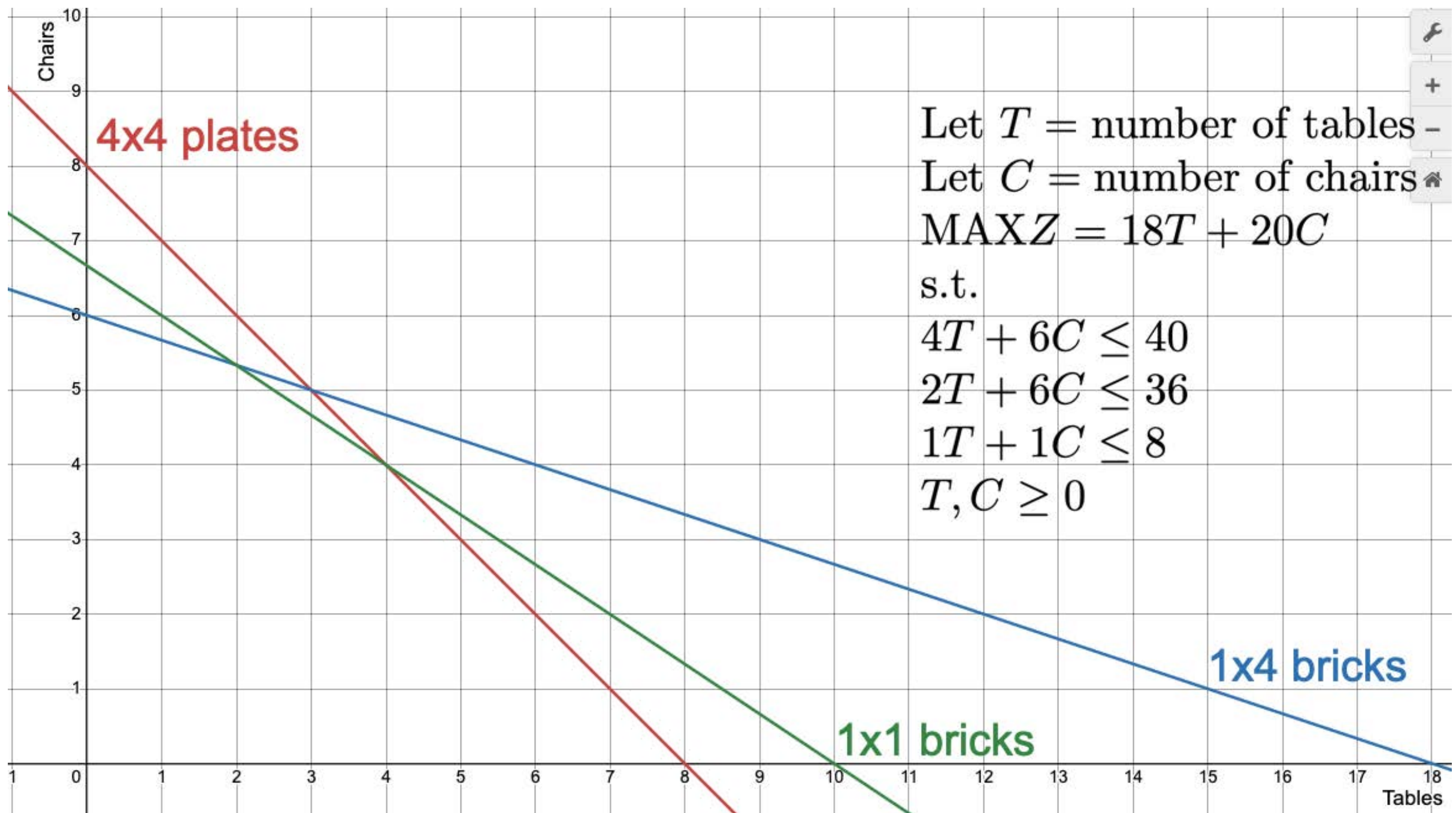
Here at the **Monochromatic Furniture Company** (MFC) we manufacture two products: Tables and Chairs.

A table requires one 4x4 plate, two 1x4 bricks, and four 1x1 bricks, while a chair requires one 4x4 plate, six 1x4 bricks, and six 1x1 bricks.

MFC has eight plates, thirty six 1x4 bricks, and forty  1x1 bricks on hand. The profit contribution for a table is \$18 and \$20 for a chair.

Normally, we'd spent some time formulating this problem into a linear programming model and answering naïve questions like “what is the maximum number of chairs that can be manufactured – why?”. For the purposes of this workshop, we'll skip those steps...





What is the profit maximizing mix of tables & chairs to produce?

What is the value of the objective function at optimality?

There is an analog device in this room that will let you check your answer...



38:47

TIME REMAINING

CLUE 3:
Numbers hold the key,
but order sets you free.
7, 3, 8, 1, 6

THINK.
SOLVE.
ESCAPE.

TEAMWORK
THINK CRITICALLY
COMMUNICATE
ESCAPE TOGETHER

CLUE 1

The first step is
not the beginning.
The end is not the end.
Find the balance
and you will transcend.



E	S	B	B	Z
B	B	B	B	B
Z	B	B	S	B
B	B	B	Z	B
B	B	Z	B	Z
Z	B	Z	Z	X

End of Class Review

BUSN 6250

Solving Element

use a naïve, analogous, or homework-style problem to unlock something...

Various s
Hasp, Box,
& "Clues"



Ludic Elements II

the versatile LEGO truck



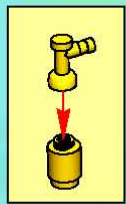
The Versatile LEGO Truck



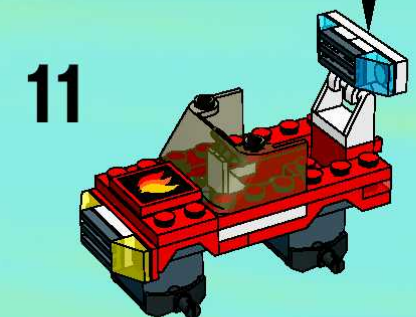
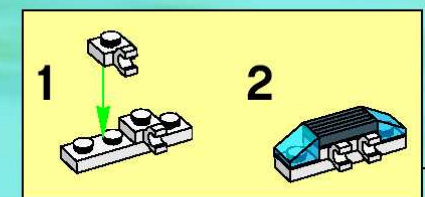
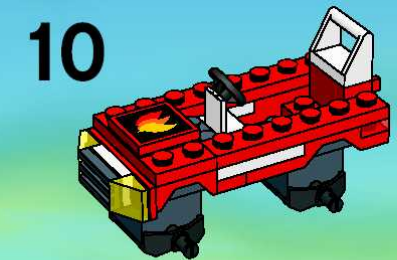
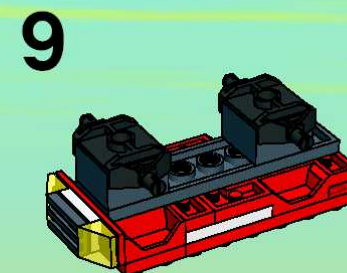
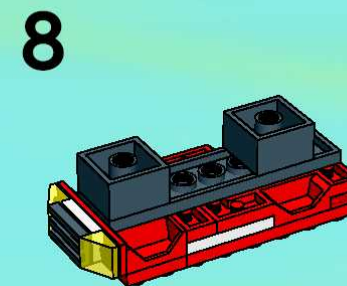
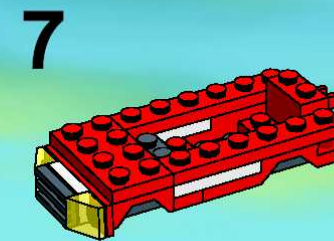
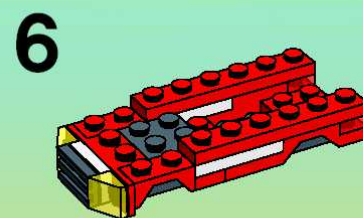
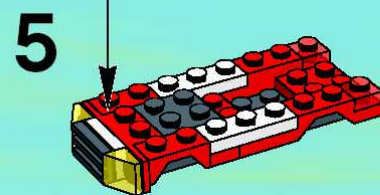
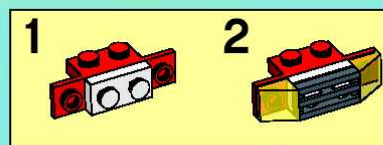
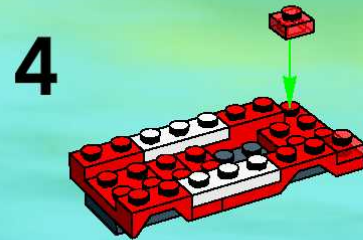
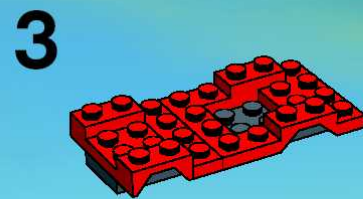
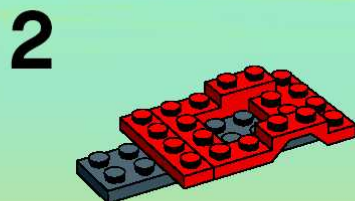
Learning Curves

1. Layout the LEGO bricks using the **Setup Pattern** page
2. Start the clock, open this booklet, **build the truck** using the instructions given.
3. When built, stop the clock, and **record your time** in the box on the **Record Results** page.

Use these instructions to build the truck:

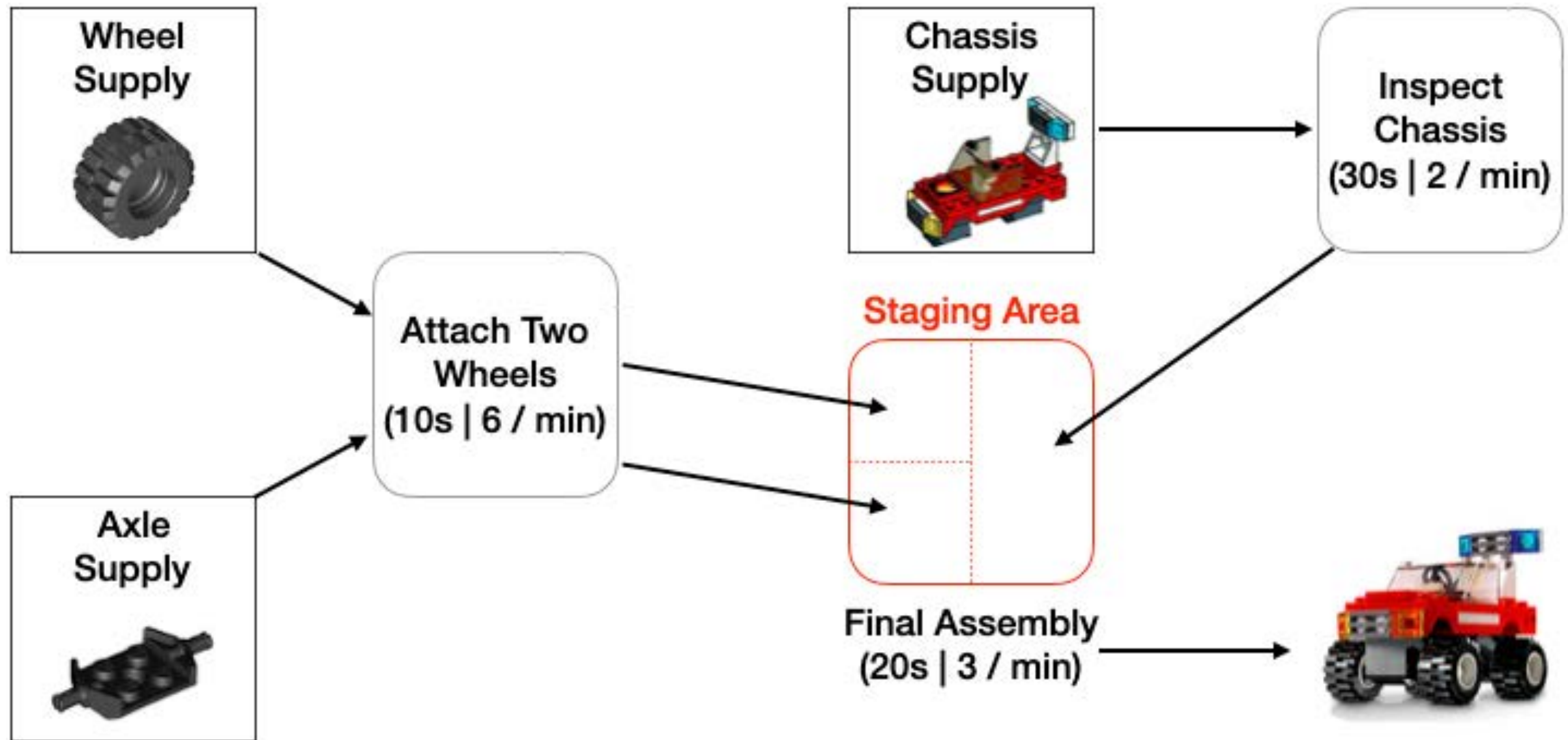


Already done



- Attach Two Wheels [popping two wheels onto one axle] (10 seconds | 6 parts/minute)
- Inspect Chassis [just checking it for defects] (30 seconds | 2 parts/minute), and
- Final Assembly [snapping the axles to the chassis] + inspection (20 seconds | 3 trucks/min.)

For safety reasons, the Staging Area does not allow deliveries of axles / chassis parts while Final Assembly is going on. The set-up looks like this:



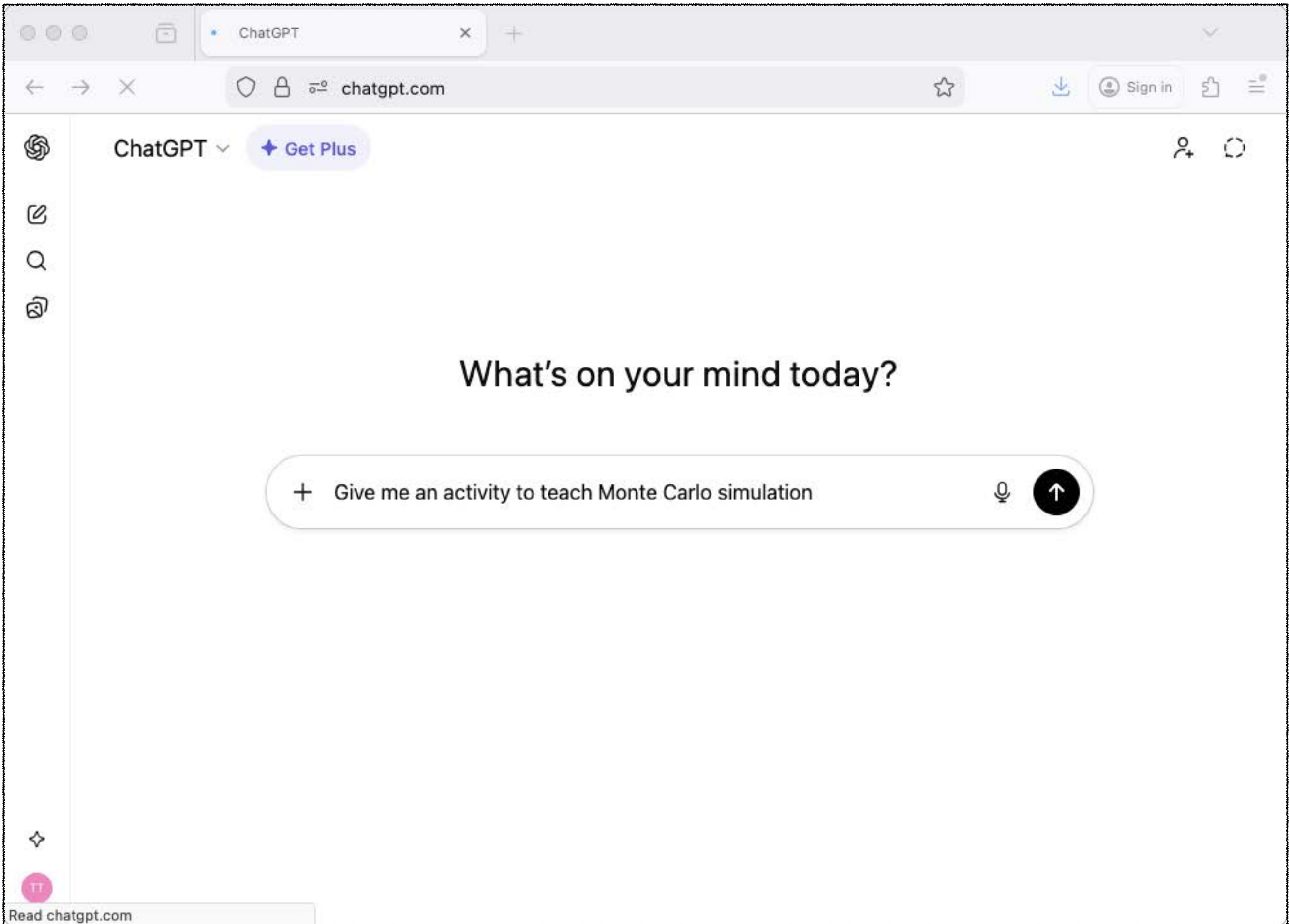
The process begins with no work in process (WIP) in any of the process areas. The clock starts and students on the Attach Two Wheels process take two wheels, one axle, put them together and at the 10s mark, move it to the Staging Area. Meanwhile, the students on the Inspect Chassis process do exactly that – make sure the steering wheel turns, the blue bar lights move, the windshield is secure, etc. The students at the Final Assembly stage are starved, waiting for all of the parts to arrive before they begin work.

Ludic Elements III

roll the bones



The Problem...



Step 3: Run the Monte Carlo (15–25 minutes)

Option A: Spreadsheet (best for MBAs)

Give them (or walk through) formulas like:

- Demand = TRIANG(min, mode, max)
- Margin = NORMINV(RAND(), mean, stdev)
- Growth = IF(RAND()<0.3, 0.9, IF(RAND()<0.7, 1.0, 1.1))

Then compute:

Profit = Demand × Margin × Growth – Fixed Cost

Have them:

- Copy down **1,000 rows**
- Calculate summary statistics

Step 3: Run the Monte Carlo (15–25 minutes)

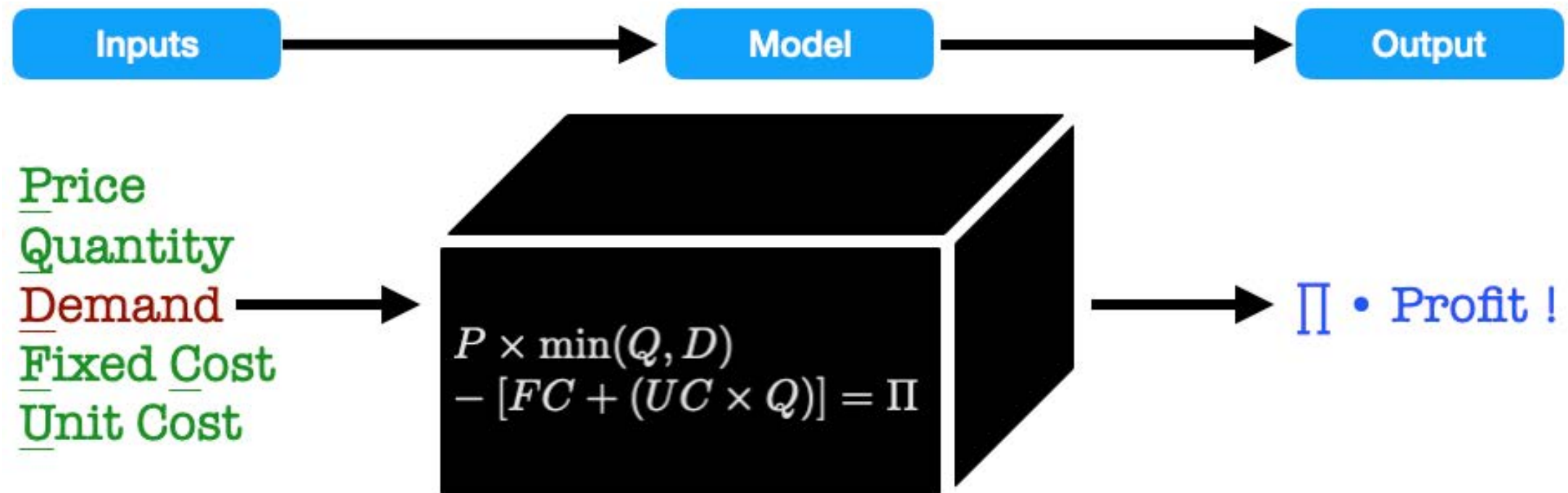
Option B: Manual “Human Monte Carlo” (great for intuition)

- Put students in groups of 3
- One student draws demand (from cards)
- One draws margin (dice or random table)
- One draws growth
- Each group runs 5–10 trials
- Pool results on the board



Ludic Pedagogy III • Roll The Bones

I had been using a Profit Model example (again, James Evans' *Business Analytics*, 3rd ed.) to begin to develop mathematical modelling techniques in students. I introduce new concepts as “black boxes” and then we dissect those boxes to reveal the inner workings. There are five inputs and one output:

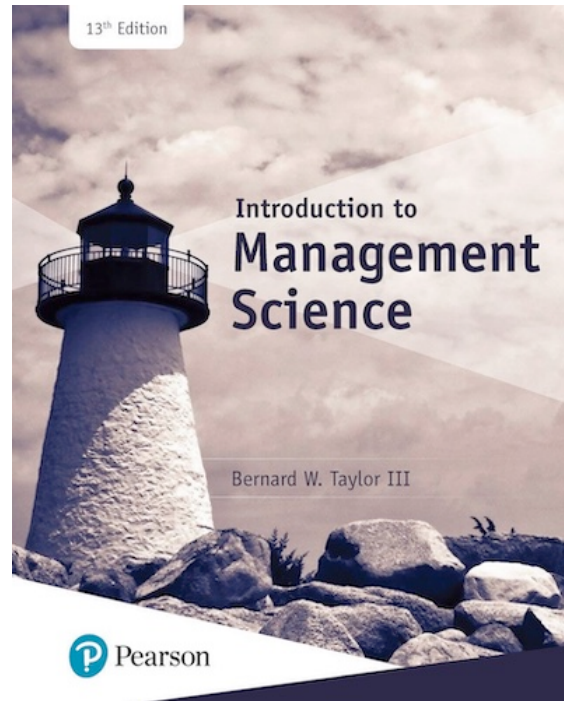


We build this model in Excel. With an initial set of parameters ($P = 40$ \$/unit, $Q = 40,000$ units, $D = 50,000$ units, $FC = \$400,000$, and $UC = 24$ \$/unit), we get a profit value of $\Pi = \$240,000$. We use this model to learn about Excel's “What-if” analysis tools — Goal Seek to determine break even point quantity, Scenario Manager for looking at changes to various values, and Data Tables to look at even more ranges of changes than Scenario Manager can handle.

When it comes time to introduce Monte Carlo Simulation, we start with ranges of values (e.g., $FC = \$400K$ or $\$450K$, $UC = 22, 23, 24$, or 25 \$/unit, and $D =$ a range of values from 40K to 60K units; most likely 50K). We calculate best case ($\Pi = \$680,000$), worst case ($\Pi = -\$350,000$), and “average” case ($\Pi = \$400,000$). Then the “boss” comes in and asks the “analyst” a number of **what-if questions** using probabilistic language:

- What is the probability of the best case scenario?
- What is the likelihood of breaking even?
- What are the chances of making more than \$400K?

Dynamic Simulation



I like this problem (Q14.17) from Taylor III's *Introduction to Management Science* (13th ed.; Pearson) and wanted to bring it to life in the classroom...

A robbery has just been committed at the Corner Market in the downtown area of the city. The market owner was able to activate the alarm, and the robber fled on foot.

Police officers arrived a few minutes later and asked the owner, "How long ago did the robber leave?" "He left only a few minutes ago," the store owner responded. "He's probably 10 blocks away by now," one of the officers said to the other.

"Not likely," said the store owner. "He was so stoned on drugs that I bet even if he has run 10 blocks, he's still only within a few blocks of here! He's probably just running in circles!"

Let's test the store owner's hypothesis: Assume that at each corner of a city block there is an equal chance that the robber will go in any one of the four possible directions: north, south, east, or west.



I designed custom north-south-east-west tetrahedral dies and had them made by a gaming supply company. Now we can do a quick version of this problem in class with erasable boards & dry-erase pens!

I use Sli.do software to get the results from the many simulations running in class and debrief.

So many uses for dies and dice in the classroom!

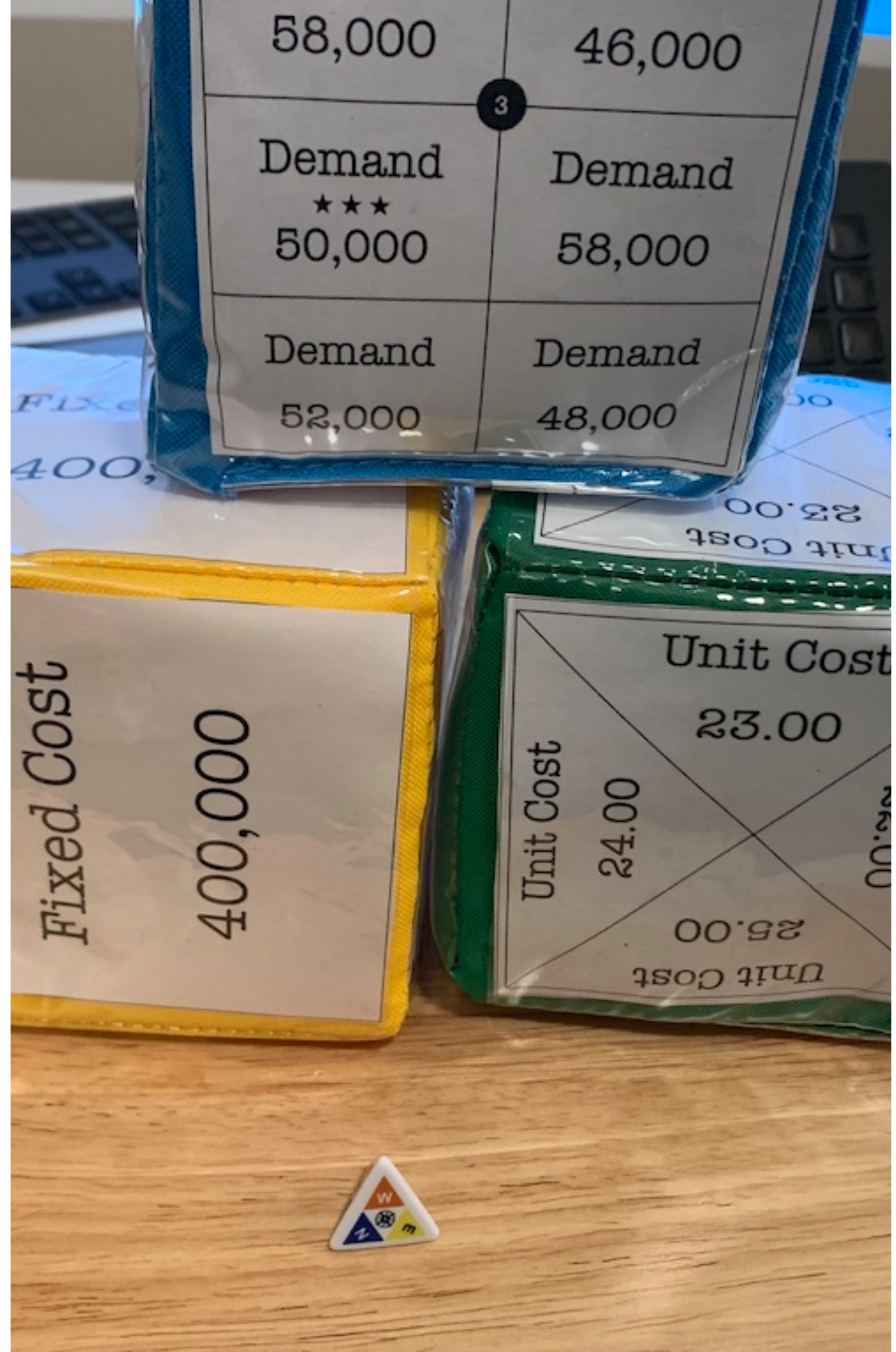
In
Class
Deets

BUSN
6250

Random Element

use dice or other devices to introduce
stochastic uncertainty into the class...

Foam Dice
Roulette
Who's First



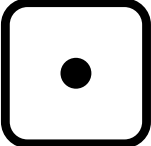


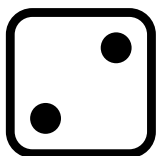
we liked the
game

Demand 54,000	Demand 44,000
Demand 48,000	Demand 40,000
Demand *** 50,000	Demand 42,000

Fixed Cost
400,000

Sidebar...

 One Row Back



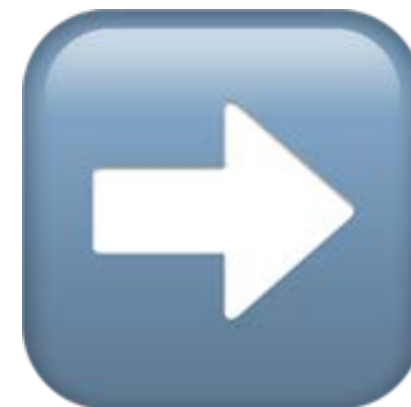
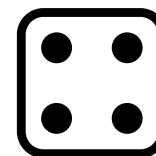
Two
Seats
Left



One
Seat
Left



Talking Stick



One
Seat
Right



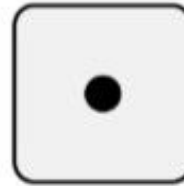
Two
Seats
Right



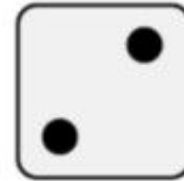
 One Row Forward

Sidebar...

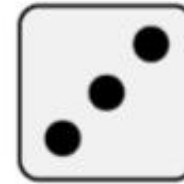
Dice Debrief



Name one new
thing you learned today.



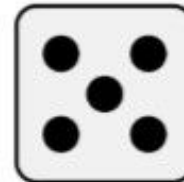
Acknowledge someone for
a job well done.



Describe a good idea you heard.



Describe a feeling
you experienced.



Describe something that pushed
you outside your comfort zone.



How will you apply what you
learned today?

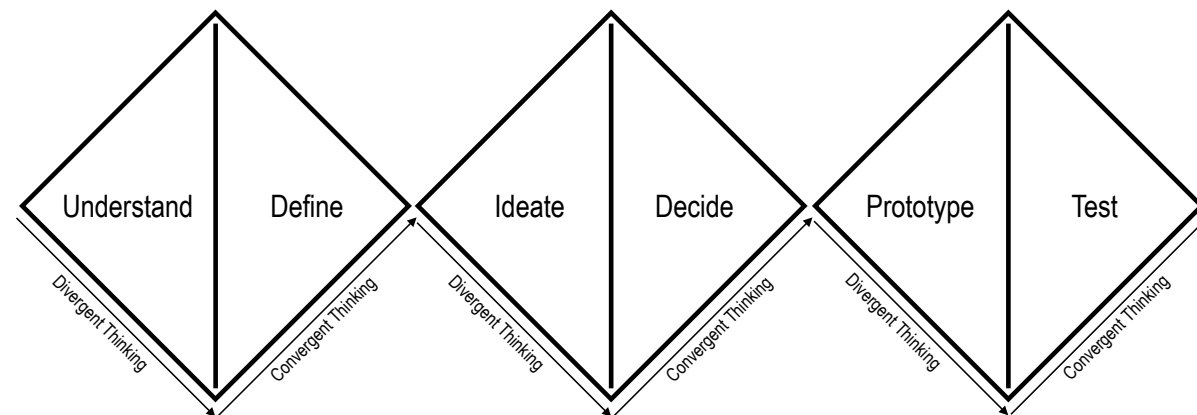


can you give me a cartoon image of a professor about to begin a design sprint – make it look like they're about to run a race

Image created • Prêt à démarrer le sprint créatif



Veni, vidi, lusi (I came, I saw, I played)
Dr. Trent Tucker | ttucker@tru.ca



My Favourite Course:
(that I like to teach)

Two Reasons WHY:
(I like to teach it)

ONE Topic from the course
that I think the students find challenging:

WHY do I think that students
find this topic challenging? (2-3 reasons)

5:00 Minutes



The Class Journey...



WHERE on this path
Could a Ludic intervention occur?

Pick
ONE point in
time



WHAT sort of
Ludic intervention to use?

Pick
ONE Ludic
element

Solving Element
use a naïve, analogous, or homework-
style problem to unlock something...

Building Element
use LEGO, card stock & crayons, or
other elements to build something...

Random Element
use dice or other devices to introduce
stochastic uncertainty into the class...

Puzzle Element
use riddles, puzzles, or logic games
to introduce or illustrate a concept...

Other Elements
use improv ideas, silly hats, getting
students out of their seats...

Lots of
extra space!

5:00 Minutes



Commit!!!



In _____,
(my favourite course)

where we will cover _____,
(troublesome topic)

I want to try _____
(ludic pedagogy element)

Everyone's favourite active learning technique...

Think

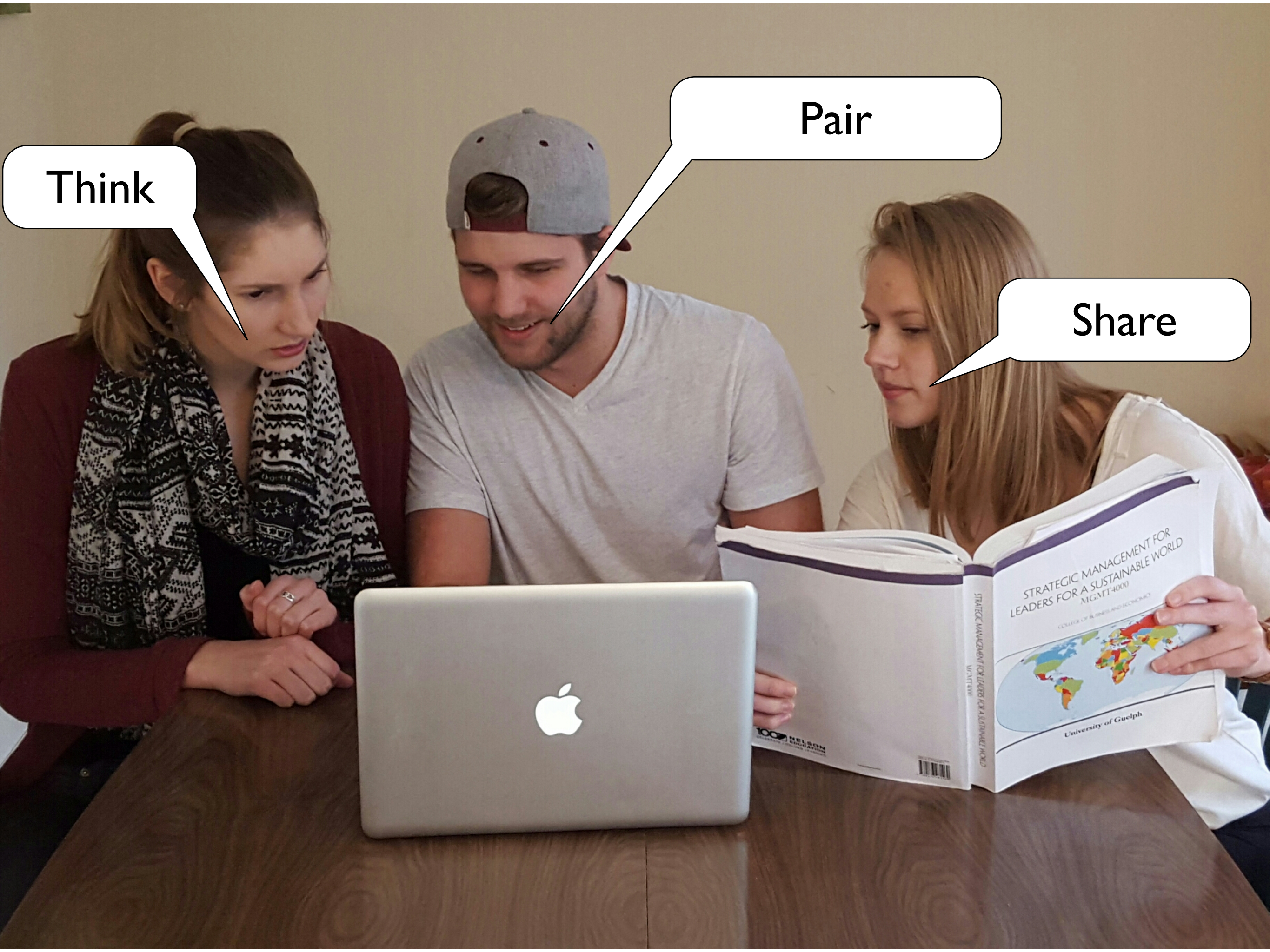
Pair

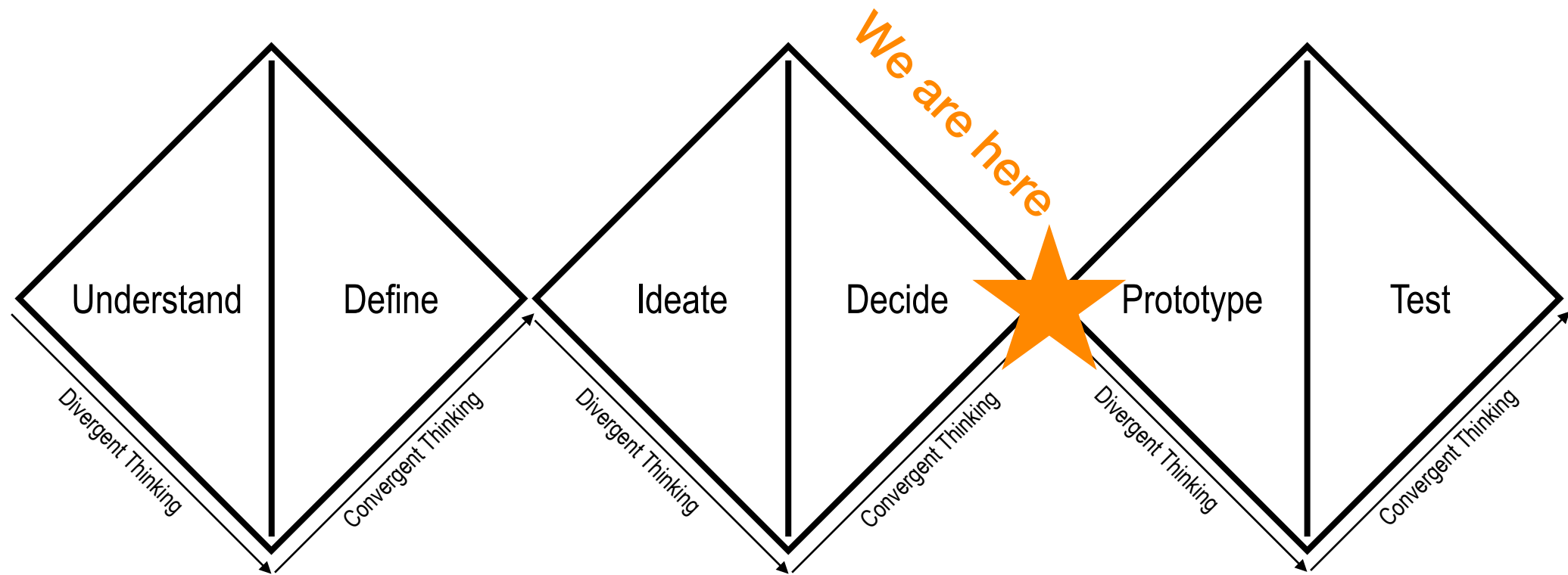
Share

Think

Pair

Share





Prototype Plan:

(what I need to do to get this working)

Test / Reflect / Iterate:

(what worked, what didn't, what to change next time 'round)

Questions?



Bob Gaglardi
School of
Business and
Economics



Let's Connect!



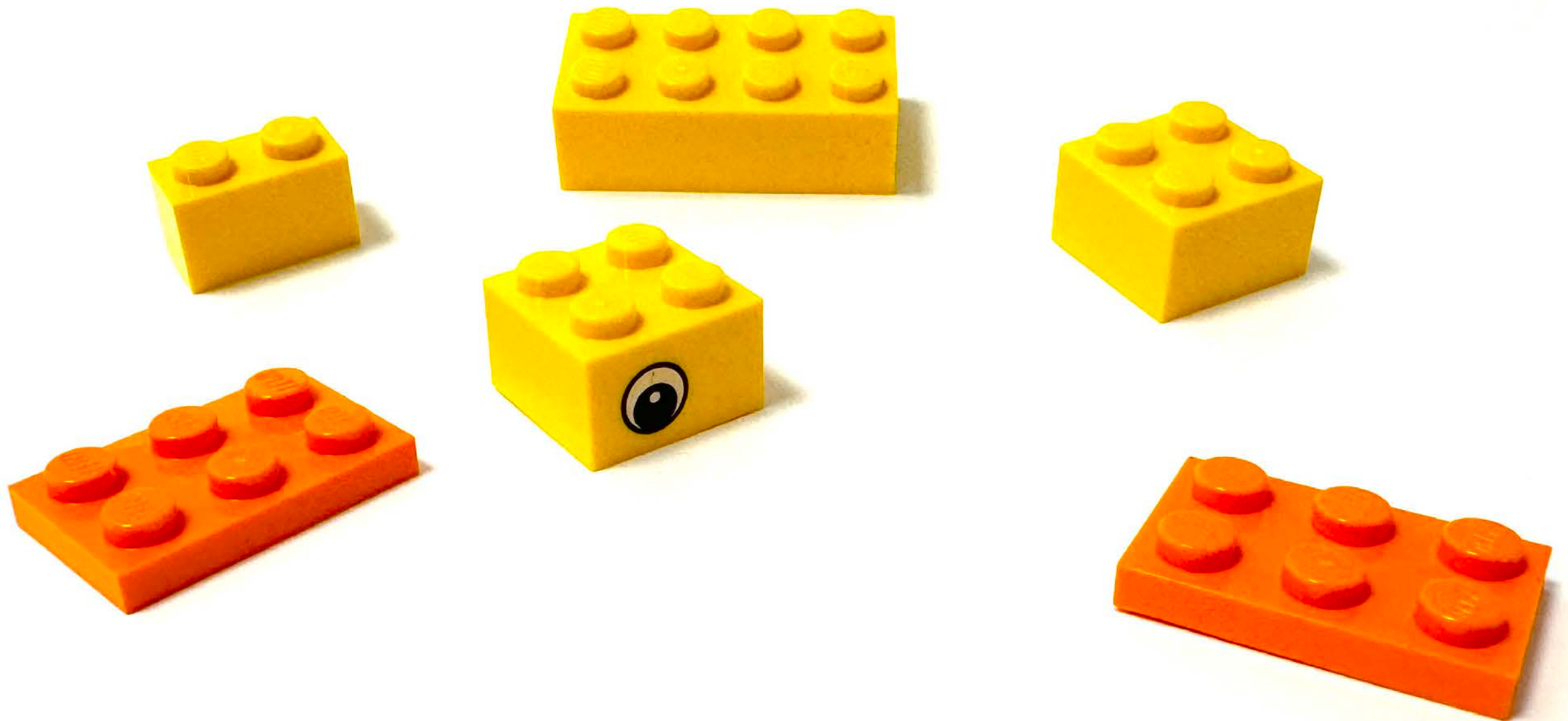
ttucker@tru.ca

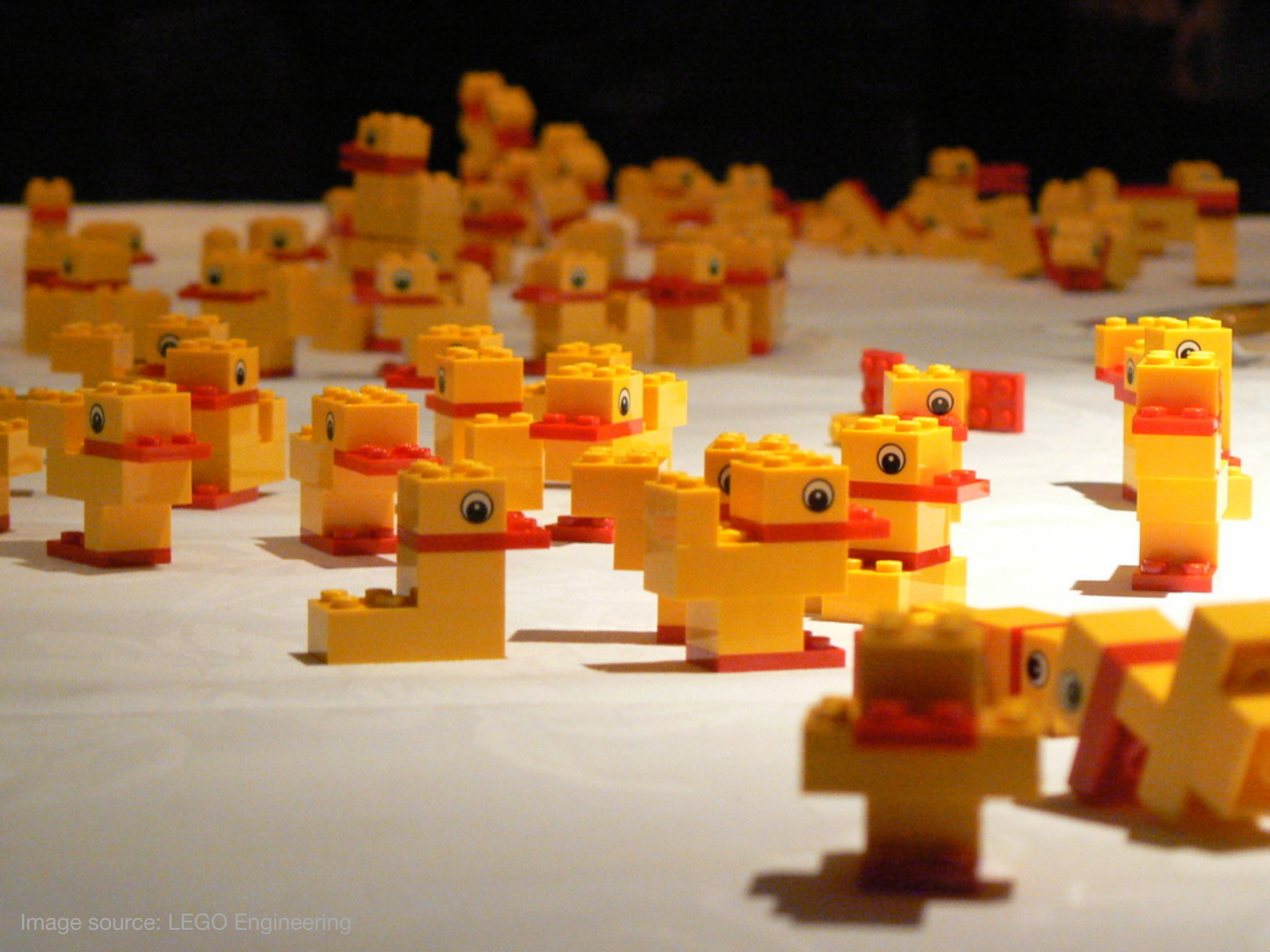
PDF handouts



Extra Slides

The Six Bricks





DuckCo !



Post BUSN
Class 6070
Assessment

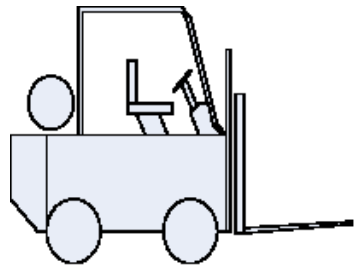
Puzzle Element

use riddles, puzzles, or logic games
to introduce or illustrate a concept...

Arrow tiles
+ directions



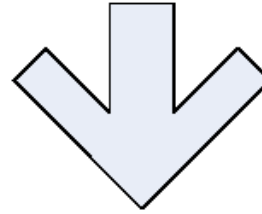
Trent's Wacky Warehouse...



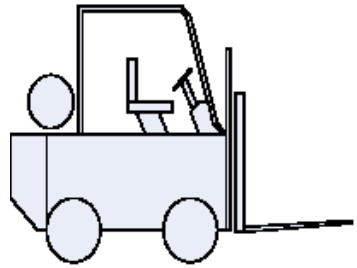
Warehouse



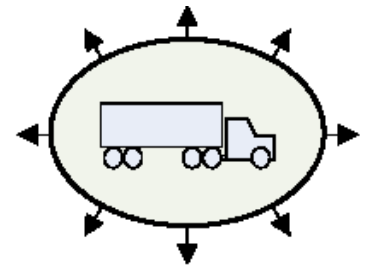
Move from this arrangement...



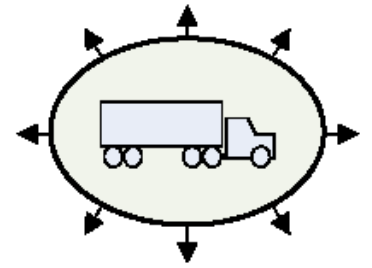
...to this one (using only three rules).



Warehouse



Loading Dock



Loading Dock

Three Simple Rules:

1. You can only face and move *forward*.
2. You can only move into *empty space*,
or around *one* person into an empty space.
3. Only *one* person can move at a time.

