INTRODUCTION

The client is a teacher (like me) using this sim game with their student.

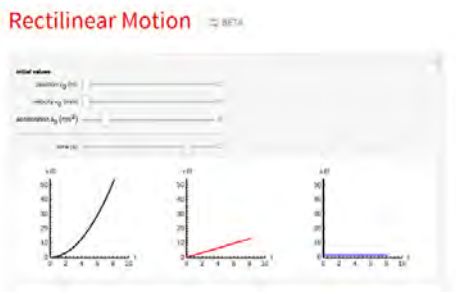
Keep in mind to:

- ✓ Ask conceptual questions
- ✓ Show hidden things
- ✓ Scaffolding

Sources of inspiration to develop my idea:

- From Level 1 Research:
  - **Game 1**: Move a Stickman Puzzle by David Wees
    - **URL**: http://davidwees.com/graphgame/
  - *SIM GAME Move a Stickman Puzzle*

- Others:
  - Simulation also inspired by http://graphsandtracks.com/#/challenges/1
  - Purchased TPT sheets to see ideas around and some vocabulary
  - Ronai Machado Lisboa "Rectilinear Motion" http://demonstrations.wolfram.com/RectilinearMotion/ Wolfram Demonstrations Project
    Published: March 7 2011

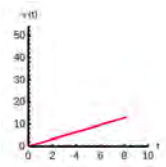
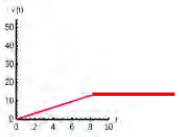
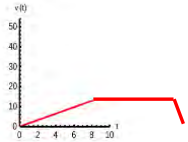


As a conclusion, I will be testing the concept of matching a real-world situation with the characteristics of the "segment" of line describing the velocity versus time (and vice versa).

Players will be challenged with matching graphs such as the ones presented in the table - >.

This will require prerequisites, so I decided on revisiting and refining the first levels scope:

- Level 1: review V-T graph axes, labels, units, how to read.
- Level 2 is a focus on understanding the speed vs. time graph.

Can you figure out a way to move your test car to obtain these three graphs below? *Experiment until you succeed*					
Phase 1		Phase 2		Phase 3	
V-T graph 		V-T graph 		V-T graph 	
What is the speed in meters per second during Phase 1?		What is the speed in meters per second during Phase 2?		What is the speed in meters per second during Phase 3?	
start	end	start	end	start	end
0	10	10	10	10	0

Therefore, the following idea used for my concept testing will be part of the **level 2** of my sim game.

Idea: players will be able to test drive so they can simulate, and match a given V-T (Velocity vs Time) graph. Situations will include stopping at a red light, driving at a constant speed on a bridge, navigating their way through heavy traffic, backing into a parking spot, crashing into a tree.

INTERNAL TESTING

Strengths	Weaknesses
• Provide a realistic simulation in more than one experiment • Players can learn about the topic with 2 representations (words, graph)	• Only one type of graph • Data table was decided to be out of scope. • One size fits all? • One on One guidance is missing
Opportunities	**Threats**
• Empower players and offer achievement opportunities. • Using the RCC environment (bridge, tree) • "Trial and check" approach is permitted and addresses different learning abilities. • Address negative values	• Unknown cost of development. Requires feasibility phase. • Heavy traffic may be difficult to simulate?

I also used the learner-player persona to complete the SWOT analysis above.

EXTERNAL TESTING

- ✓ I tested the concept with a family member first. See next page, in brown color the changes made during the concept testing discussion.
- ✓ I will use licensed short videos or images to illustrate the 5 situations. *Images below are temporary*.

Story: I only used short sentences. They could be introduced by some background character tbd. My wording does not talk about speed at all on purpose. Less is best.
Art: I will use licensed short videos or images to illustrate the 5 situations. *Images below are temporary*.
Skills rewards: The player will experiment and will drive the test car to mimic the same segments and **gain skills rewards**. (added in my blog)

NOTE: I removed data set tables – may prove complex and boring for the game. During ly students testing session, students also did not really understand why they were asked to do a table.

FIRST CONCEPT TESTING:.

1) Test with family + 2) Test with students

Think about a real-world situation. What happened with the velocity? Answer with words and V-T graph. *[~~tables~~ removed after concept testing]*

Situation 1

The traffic sign just turned red. Jibril reacted as needed.
Imagine what happened with the car's velocity?

A: Speed decreases but not instantly, there is a delay

Situation 2

Traffic is dense. Drivers must be careful.

Imagine what happened with the yellow car's velocity?

A: adapt speed to traffic, graph shows many variations of speed

Situation 3

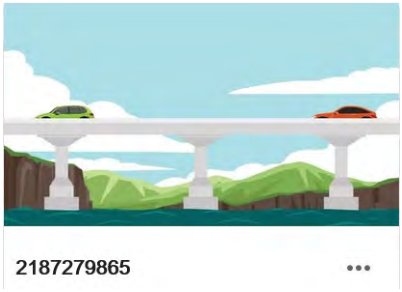
~~These two vehicles drive safely and keep their distance. (needed to be refined)~~

These two vehicles drive responsibly and have kept the same safety distance between them for quite a long time.

Imagine what happened with the velocity of these cars?

A: ~~red adapts speeds to green car (not the answer I wanted)~~

My answer: both car drive with a constant speed (equal to speed limit)



Situation 4 (added after testing with family, selected carefully the image to crash against a tree and not too scary)

~~Two~~ One car got into an accident

A: V-T graph shows a vertical line. Speed has decreased instantly

Situation 5 (added after testing with family! Exploring negative values)

You are lucky. You just found a parking spot.

A: car moves forward, pass the spot, gets in rear gear to park. Velocity decrease to zero, and increase backward, decrease and stops. V-T graph: line goes down, goes below zero, continues to increase negatively and then decrease and stop.

NEXT PAGE : concept testing with my students (localized in French)

CONCEPT TESTING

A partir des situations suivantes, imaginer les caractéristiques de la vitesse et expliquer quelles seront ses variations. Pour chaque situation, faire une ou deux phrases, **et** un diagramme de la Vitesse en fonction du Temps, **et** un tableau de valeurs bien organisé.

Situation 1 : Le feu tricolore vient juste de passer au rouge. Jibril a été surpris mais il a bien réagi. Imaginer ce qui s'est passé.

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Situation 2 : La circulation est dense. Les conducteurs doivent être prudents et réagir vite. Imaginer ce qui se passe pour la première voiture devant à gauche.

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Situation 3 : Deux conducteurs de véhicules conduisent de façon responsable. Ils ont conservé la même distance de sécurité pendant une période de temps assez longue. Imaginer ce qui se passe ?

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Situation 4 : Une voiture a eu un accident. Imaginer ce qui s'est passé ?

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Situation 5 : Quelle chance ! Une place de parking vient de se libérer. Imaginer ce qui se passe ?

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SEE SELECTED SAMPLES OF STUDENTS WORK in APPENDIX

REPORT

What part of the game idea were you testing each time? (What was your goal for your concept test? -- these can be different for each test if you run multiple!)

- My goal was to expose the ideas, see what situations made sense or not. If students would respond positively and increase their engagement. I wanted to see if I could refine them, add or remove elements.

SWOT Analysis and the Results

- From this, I think I should consider having some other character there to talk to the player and add social interactions. Also, instead of doing the 5 situations, they could do at least 3, but not all. (so it is customizable somehow). The other 2 solutions will be given.

Summarize each Team Member's testing (indicate which Team Member did which test): see above

Who were your external tester(s)?

- 1 family member,
- A class with 9 students completing vocational high school at the end of the year.

How did you conduct the external test? (what type of testing did you use?, what type of feedback did you collect?)

- I used a puzzle activity. Refined it between my first version, testing with family and then testing with students. See my worksheet above.

Summarize the findings, what *are they telling you about your idea*.

- Findings show me that some of my ideas may be too complex to implement. I could also not see additional ideas that could work well. Concept testing allowed me to gain these and let go of some aspects. Overall, my ideas worked well.

Reflect on your findings from both types of test, **what was helpful, what wasn't helpful**, what are some possible next steps?

- Concept testing was very helpful. It showed me where things flow and where learners could be stuck. I also realized I need to get into more details about the reward for players. Testing was exciting to see how my ideas work. They expand on things done by others but also innovate incrementally.
- Testing at this design stage could not address the interactivity of the experience. Next is a feasibility phase to see the coding requirement with Unity, the cost of development, assets and plugins that could be used to alleviate the total cost.

APPENDIX

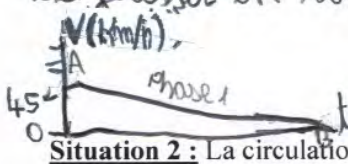
(See content next page)

Mécanique – Mouvement : analyse des variations de la vitesse d'un objet

A partir des situations suivantes, imaginer les caractéristiques de la vitesse et expliquer quelles seront ses variations. Pour chaque situation, faire une ou deux phrases, **et** un diagramme de la Vitesse en fonction du Temps, **et** un tableau de valeurs bien organisé.

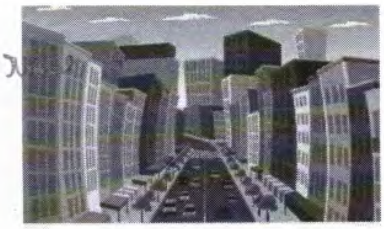
Situation 1 : Le feu tricolore vient juste de passer au rouge. Jibril a été surpris mais il a bien réagi. Imaginer ce qui s'est passé.

La Voiture à Fait une Freinage d'urgence car le feu est passer en rouge.

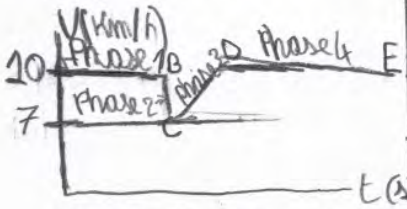


	Initial	Finale
Phase	VA=45 Km/h	VB=0 Km/h

Situation 2 : La circulation est dense. Les conducteurs doivent être prudents et réagir vite. Imaginer ce qui se passe pour la première voiture devant à gauche.

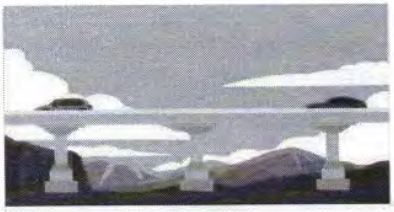


la premiere Voiture passe à droit pour continuer sa r

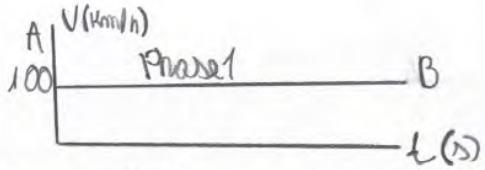


	Initial	Final
P1	VA=10 Km/h	VB=10 Km/h
P2	VB=10 Km/h	VC=7 Km/h
P3	VC=7 Km/h	VD=10 Km/h
P4	VD=10 Km/h	VE=10 Km/h

Situation 3 : Deux conducteurs de véhicules conduisent de façon responsable. Ils ont conservé la même distance de sécurité pendant une période de temps assez longue. Imaginer ce qui se passe ?



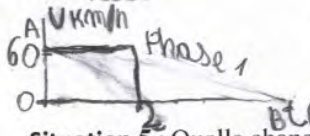
la Voiture de devant lui dis de lui suivre



	Initial	Final
Phase 1	VA=100 Km/h	VB=100 Km/h

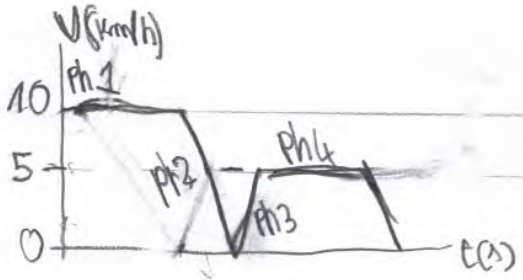
Situation 4 : Une voiture a eu un accident. Imaginer ce qui s'est passé ?

le chauffeur il a Fait un malaise car il a Trop rouler.



	Initial	Finale
Phase 1	VA=60 Km/h	VB=0 Km/h

Situation 5 : Quelle chance ! Une place de parking vient de se libérer. Imaginer ce qui se passe ?



P1	VA 10 Km/h	
P2		
P3		
P4		

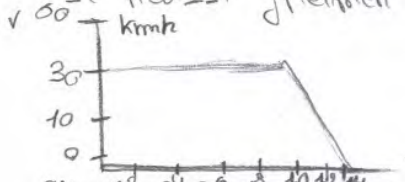
[redacted]

Mécanique – Mouvement : analyse des variations de la vitesse d'un objet

A partir des situations suivantes, imaginer les caractéristiques de la vitesse et expliquer quelles seront ses variations. Pour chaque situation, faire une ou deux phrases, **et** un diagramme de la Vitesse en fonction du Temps, **et** un tableau de valeurs bien organisé.

Situation 1 : Le feu tricolore vient juste de passer au rouge. Jibril a été surpris mais il a bien réagi. Imaginer ce qui s'est passé.

JP reussi freinen a temps il a 30 Km/h

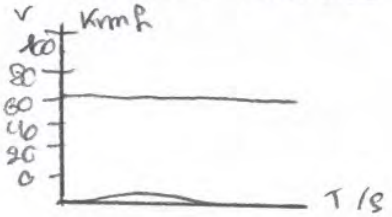


	Freinag	
	début	Fin
vitesse	10	14

Situation 2 : La circulation est dense. Les conducteurs doivent être prudents et réagir vite. Imaginer ce qui se passe pour la première voiture devant à gauche. Elle freine ce qui force la voiture de derrien a freiné aussi

	Freim		
vitesse	debu	mulie	Fin
	40	50	60

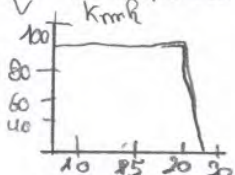
Situation 3 : Deux conducteurs de véhicules conduisent de façon responsable. Ils ont conservé la même distance de sécurité pendant une période de temps assez longue. Imaginer ce qui se passe ? JP ne se passe rien et il continue de rouler normalement



	début	Fin
vitesse	60	60

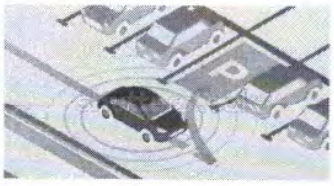
Situation 4 : Une voiture a eu un accident. Imaginer ce qui s'est passé ?

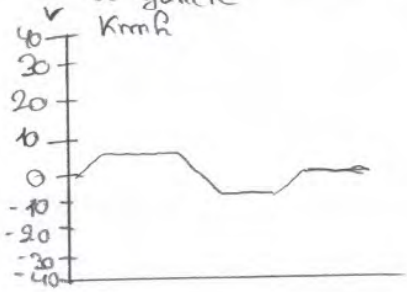
JP a perdu le controle et il bate contre un arbre



	Impacte	
	début	Fin
vitesse	90	0

Situation 5 : Quelle chance ! Une place de parking vient de se libérer. Imaginer ce qui se passe ? La voiture s'avance pour reculé et ce garen





	Freim		
vitesse	avant	recule	arret
	5	-5	0

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Biemaimé
TCMIS

Mécanique – Mouvement : analyse des variations de la vitesse d'un objet

A partir des situations suivantes, imaginer les caractéristiques de la vitesse et expliquer quelles seront ses variations. Pour chaque situation, faire une ou deux phrases, **et** un diagramme de la Vitesse en fonction du Temps, **et** un tableau de valeurs bien organisé.

Situation 1 : Le feu tricolore vient juste de passer au rouge. Jibril a été surpris mais il a bien réagi. Imaginer ce qui s'est passé.

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le vehicule commence à ralentir

Situation 2 : La circulation est dense. Les conducteurs doivent être prudents et réagir vite. Imaginer ce qui se passe pour la première voiture devant à gauche.

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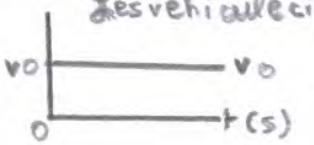
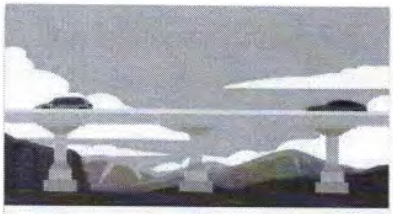
Les vehicule circule dans une ville



Situation 3 : Deux conducteurs de véhicules conduisent de façon responsable. Ils ont conservé la même distance de sécurité pendant une période de temps assez longue. Imaginer ce qui se passe ?



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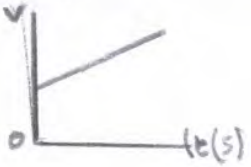
le vehicule va commencer a accéléré pour effectuer un depassement



Situation 4 : Une voiture a eu un accident. Imaginer ce qui s'est passé ?

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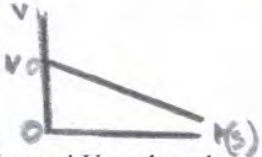
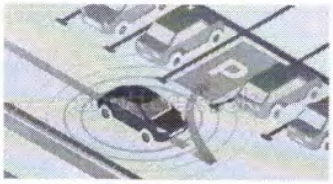
le vehicule à reçue un choc donc la vitesse à chuté



Situation 5 : Quelle chance ! Une place de parking vient de se libérer. Imaginer ce qui se passe ?



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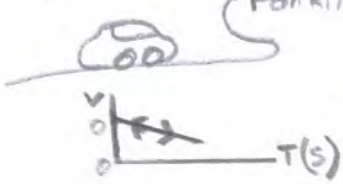
le vehicule roule puis il trouve une place de parking libre puis ralenti puis le vehicule fait sa manoeuvre arrière puis gare au Parking



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Mécanique – Mouvement : analyse des variations de la vitesse d'objet

A partir des situations suivantes, imaginer les caractéristiques de la vitesse et expliquer quelles seront ses variations. Pour chaque situation, faire une ou deux phrases, **et** un diagramme de la Vitesse en fonction du Temps, **et** un tableau de valeurs bien organisé.

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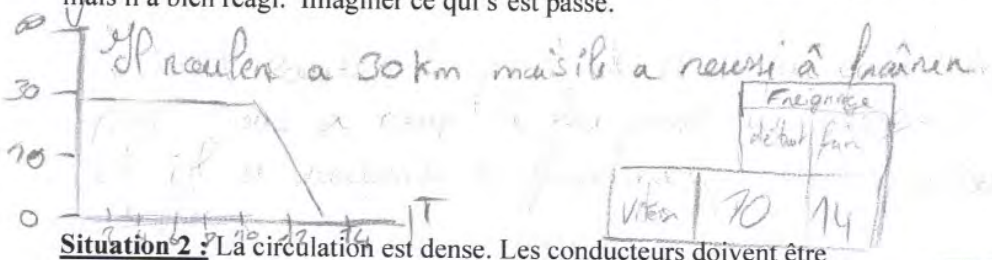
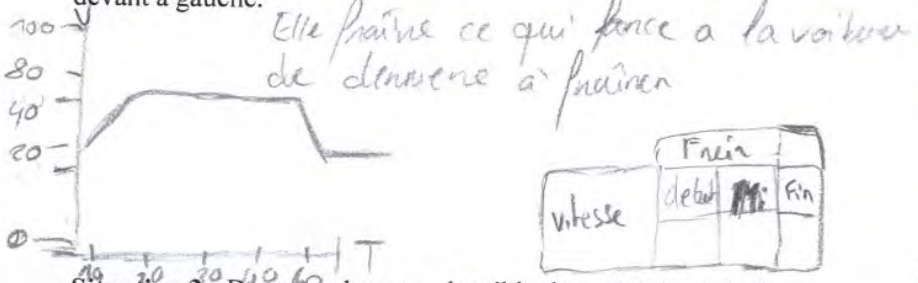
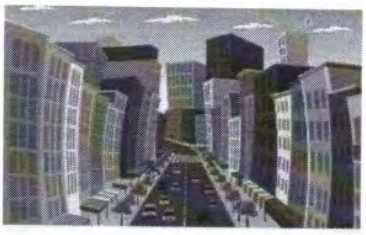


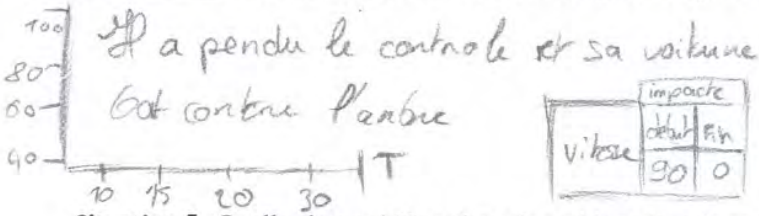
Situation 2 : La circulation est dense. Les conducteurs doivent être prudents et réagir vite. Imaginer ce qui se passe pour la première voiture devant à gauche.





Situation 3 : Deux conducteurs de véhicules conduisent de façon responsable. Ils ont conservé la même distance de sécurité pendant une période de temps assez longue. Imaginer ce qui se passe ?

Situation 4 : Une voiture a eu un accident. Imaginer ce qui s'est passé ?



Situation 5 : Quelle chance ! Une place de parking vient de se libérer. Imaginer ce qui se passe ?