Caroline Cooney
ET513
Boise State University
Spring 2017, Week 2

Characteristics of Good Elearning:
According to Clark and Mayer, Good elearning should “take a learner centered approach..., and consider how technology... can be used in ways to support the cognitive processes of: selection, rehearsal, load management, and retrieval.”. (p. 45). Additionally, good elearning should

1. Minimize extraneous cognitive processes
2. Manage essential processes
3. Foster generative processes (Clark, p. 39)

In order to learn students must be active learners (Clark, p 44) and must engage in the following cognitive processes:

1. Select information
2. Manage working memory
3. Integrate visual and verbal information into long term memory from working memory
4. Retrieve the new information from long term memory

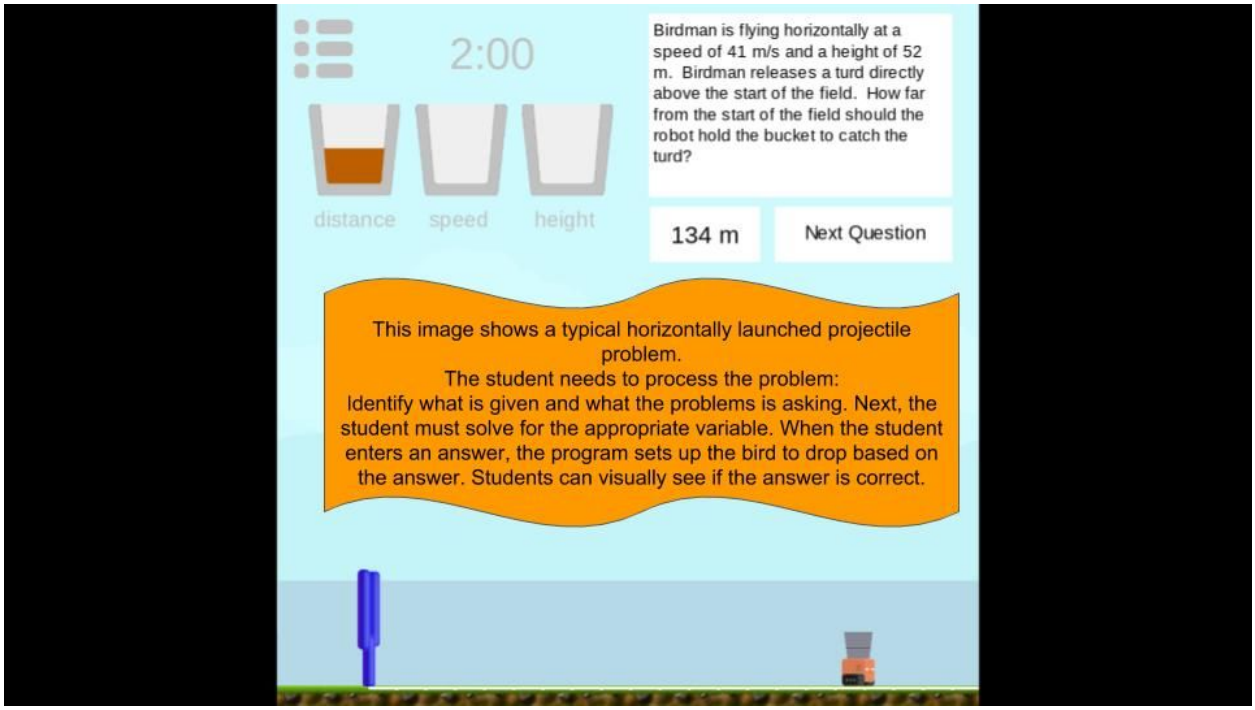
Good elearning helps learners with the cognitive processes listed by adhering to the following ideas:

Process	**How elearning can help**
Select information	1. Highlighting key information, 2. limit amount of information
Manage working memory	“Less is More” approach 1. Use succinct text 2. Reduce extraneous information and audio/visuals: such as no flashing lights or background music 3. Break complex ideas into manageable "chunks"
Integrate visual & verbal information to long term memory	1. Keep visual and verbal information close together 2. Process information in working memory with practice problems &/or worked examples
Retrieve newly learned information from long term memory	1. Create a “retrieval hook” by applying to relevant situations

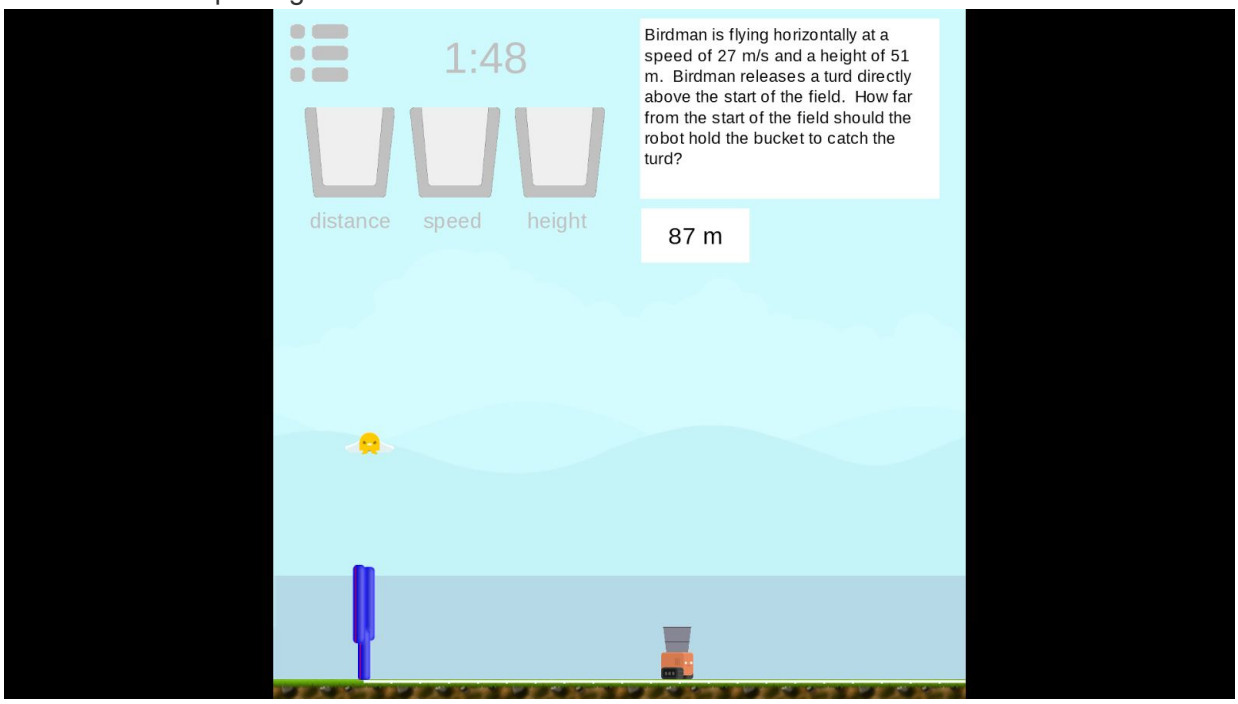
Activity One Good Example

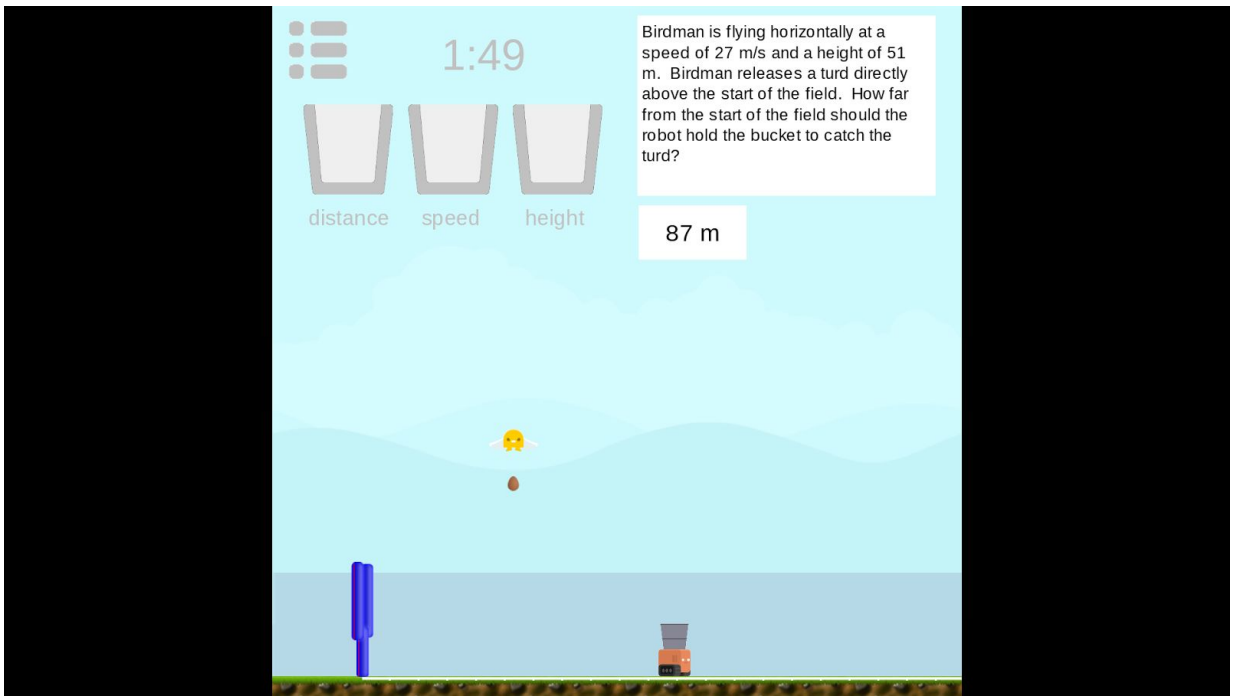
1. **Name**: Turd the Target

2. **Where**: http://www.physicsclassroom.com/Physics-Interactives/Vectors-and-Projectiles/Turd-the-Target/Turd-the-Target-Interactive
3. **What**: Students learn how to solve horizontally launched projectiles. This activity assumes students have had an introduction to projectile motions, and are in the process of learning how to apply the concepts to solve problems. In the activity, the student needs to determine the "givens" or "knowns" in the problem, determine what they need to solve for, and then apply the equations to find the answer. The student enters the answer & hits "check answer". The bird then flies and releases the "package" & students can visually see if they got it correct. The student is successful when he or she correctly solves two of each problem type, and the cups fill.

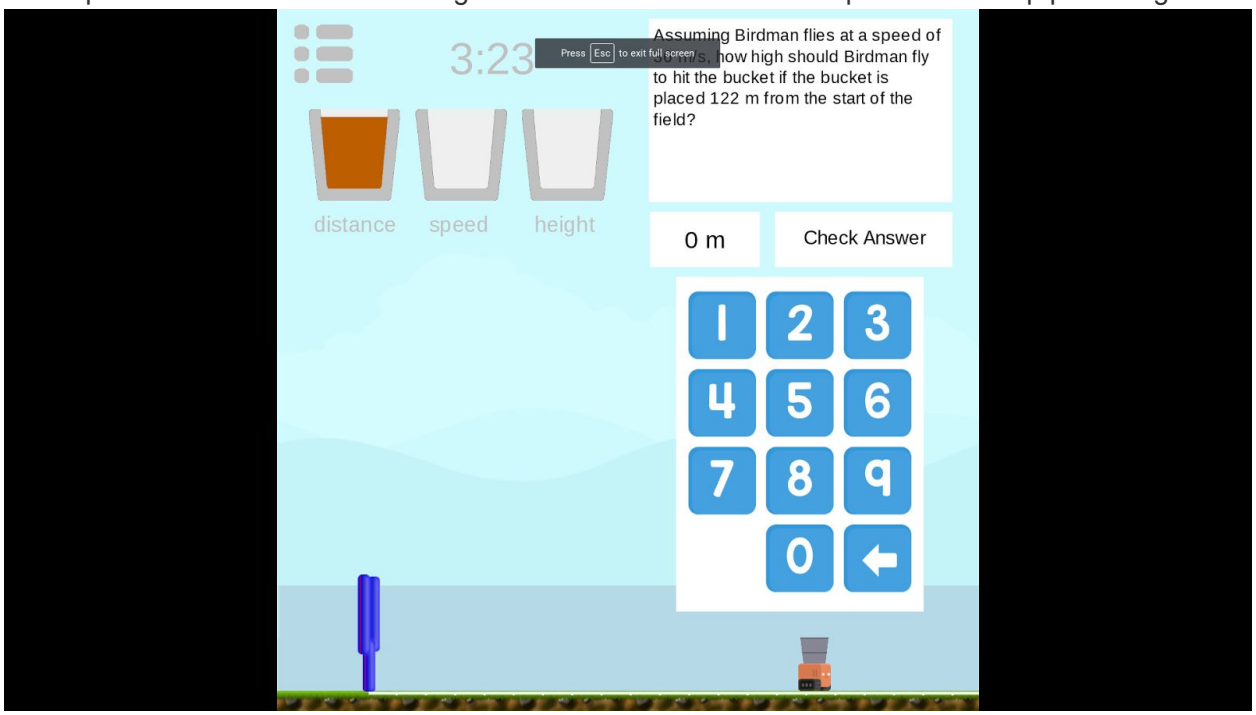


The next two images show what happens once the student enters an answer. The bird flies across and releases the package.





The cup fills if the answer hits the target. The student chooses next question to keep practicing.



4. **Good or bad**: Good.
5. **Why:**

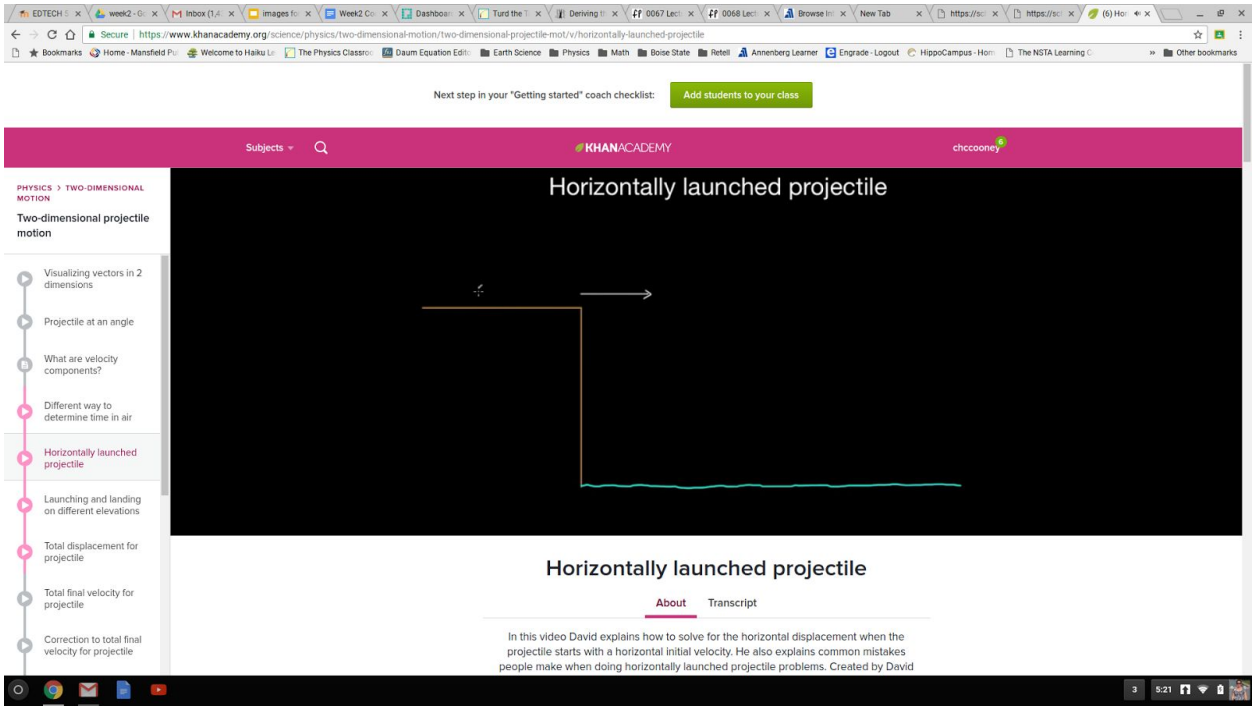
A good elearning activity should…
be student centered so that the student has to actively engage with the content. Additionally, a good elearning activity should limit the extraneous information, manage working memory by limiting the amount of information the student needs to process, aid working memory with problems and examples, and aid students with retrieval of the information.

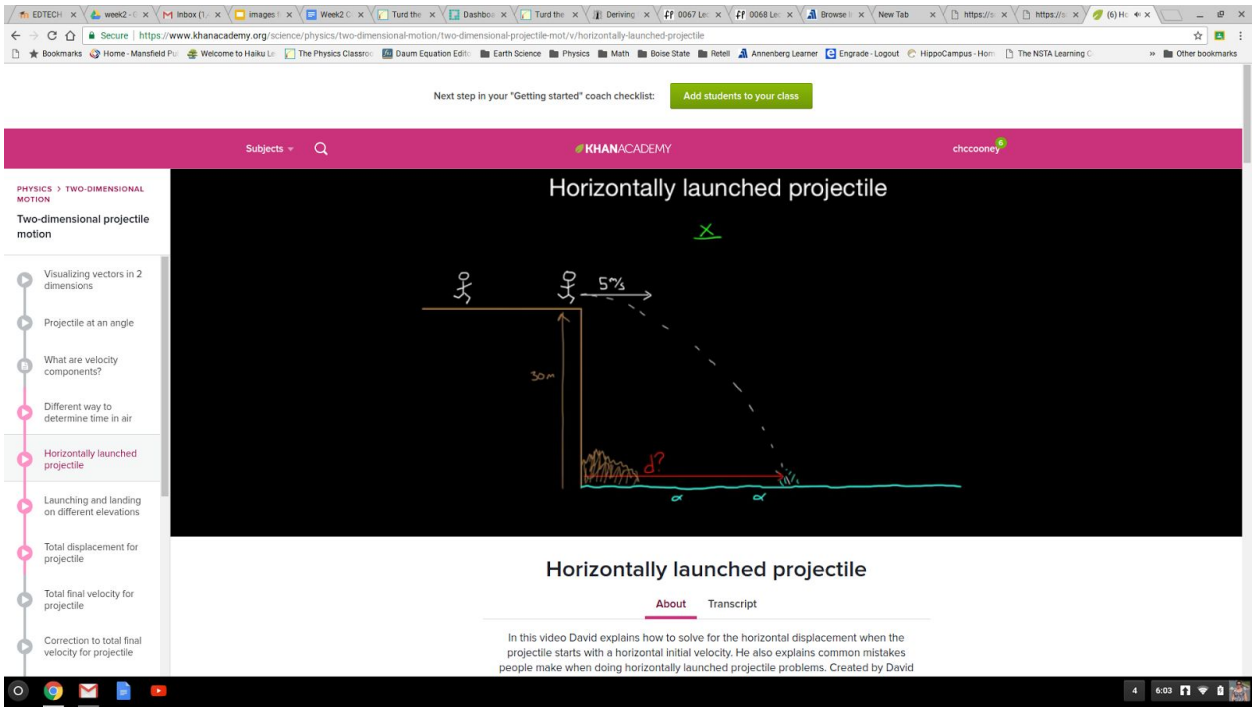
Idea or principle	**Idea or Principle met yes or no**	**Why/Why not**
Be student centered and actively engage the student	Yes	The student cannot complete the interactive without actively solving the problems.
Aid the selection process by 1. Highlighting key information, 2. limiting amount of information	1. No 2. Yes	While it does not highlight key information, it does limit the amount of information for each problem. Physics problems are notorious for adding in “extra” information that is not needed. These problems give just what is needed.
Manage working memory by 1. Using succinct text 2. Reducing extraneous information and audio/visuals: such as no flashing lights or	1. Yes 2. Yes	The text is to the point. There are no extra bells and whistles, but the graphics clearly show the concepts.

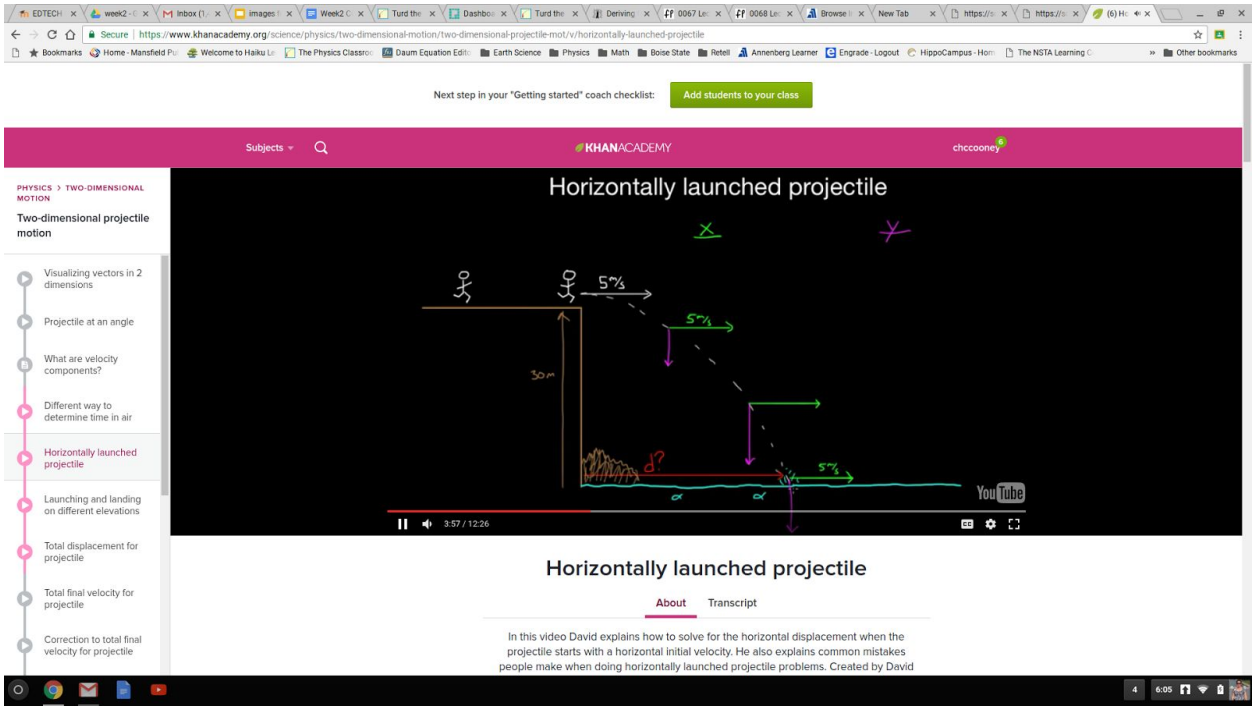
background music 3. Breaking complex ideas into manageable "chunks"	3. Yes	Problems are broken into different types, students must determine the type (solving for distance from target, speed, or launch height
Integrate visual & verbal information to long term memory by 1. Keeping visual and verbal information close together 2. Processing in working memory with practice problems &/or worked examples that will aid long term memory.	1. Yes 2. Yes	The problems are clear and easy to find. The visuals and animations are with the problem, so students can follow along. The problems are excellent examples of this problem type, and students must solve the problems in order to complete the activity.proce By solving the problems, the process of how to solve these problems will transfer to long term memory.
Retrieve newly learned information from long term memory by using relevant practice & retrieval “hooks”	Yes	After solving these different problem types, students should have a strategy for solving future problems they encounter. Since they have seen different situations, they should be able to attack the problems in an orderly fashion, as they retrieve the steps from their long term memory.

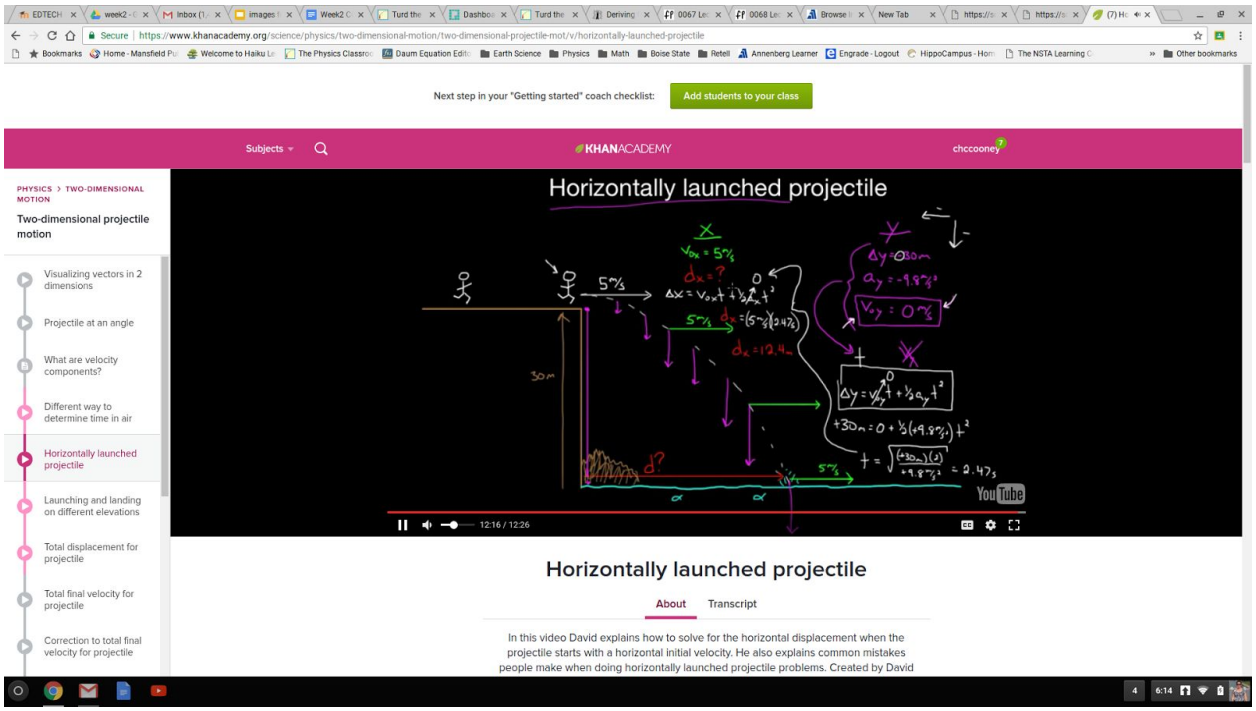
Activity Two Bad Example

1. **Name**: Horizontally Launched Projectile Problem
2. **Where**: https://www.khanacademy.org/science/physics/two-dimensional-motion/two-dimensional-projectile-mot/v/horizontally-launched-projectile
3. **What**: A video lecture from Kahn Academy on how to solve horizontally launched projectile problems


Next step in your "Getting started" coach checklist:
Add students to your class
Subjects
KHANACADEMY
chccooney
PHYSICS > TWO-DIMENSIONAL MOTION
Two-dimensional projectile motion
Visualizing vectors in 2 dimensions
Projectile at an angle
What are velocity components?
Different way to determine time in air
Horizontally launched projectile
Launching and landing on different elevations
Total displacement for projectile
Total final velocity for projectile
Correction to total final velocity for projectile
Horizontally launched projectile
Horizontally launched projectile
About
Transcript
In this video David explains how to solve for the horizontal displacement when the projectile starts with a horizontal initial velocity. He also explains common mistakes people make when doing horizontally launched projectile problems. Created by David


Next step in your "Getting started" coach checklist:
Add students to your class
Subjects
KHANACADEMY
chccooney
PHYSICS > TWO-DIMENSIONAL MOTION
Two-dimensional projectile motion
Visualizing vectors in 2 dimensions
Projectile at an angle
What are velocity components?
Different way to determine time in air
Horizontally launched projectile
Launching and landing on different elevations
Total displacement for projectile
Total final velocity for projectile
Correction to total final velocity for projectile
Horizontally launched projectile
X
5 m/s
30 m
d?
Horizontally launched projectile
About
Transcript
In this video David explains how to solve for the horizontal displacement when the projectile starts with a horizontal initial velocity. He also explains common mistakes people make when doing horizontally launched projectile problems. Created by David





4. **Good or bad**: Bad
5. **Why:**

A good elearning activity should…
be student centered so that the student has to actively engage with the content. Additionally, a good elearning activity should limit the extraneous information, manage working memory by limiting the amount of information the student needs to process, aid working memory with problems and examples, and aid students with retrieval of the information. Overall, this is a good explanation &

example, but lacks the student engagement and practice which is necessary for retrieval, so that is why I classified it in the “bad” category.

Idea or principle	**Idea or Principle met yes or no**	**Why/Why not**
Be student centered and actively engage the student	NO	The student is not actively engaged in solving problems. The student watches as the narrator solves the problem & explains common mistakes.
Aid the selection process by 1. Highlighting key information, 2. Limiting amount of information	1. Yes 2. Yes	The explanation clearly highlights the pertinent information to the problem. The narrator limits the amount of information, and explains the information.
Manage working memory by 1. Using succinct text 2. Reducing extraneous information and audio/visuals: such as no flashing lights or background music 3. Breaking complex ideas into manageable "chunks"	1. Yes 2. Yes 3. Yes	The text is to the point. There are no extra bells and whistles, the narrator writes the key informationu The problem is broken into two parts (horizontal & vertical)
Integrate visual & verbal information to long term memory by 1. Keeping visual and verbal information close together 2. Processing in working memory with practice problems &/or worked examples that will aid long term memory.	1. Yes 2. No	The information is close together, and students can follow along. The problems is a good example, but students simply watch the narrator solve. Students need to practice solving problems to learn the nuances, so they can easily identify problems types, and then apply their knowledge to solve the problems. This video would be a good lesson to refresh students or in conjunction with a set of problems.
Retrieve newly learned information from long term memory by using relevant practice & retrieval “hooks”	No	This is a good example, but students do not have the opportunity to actively engage & practice problem solving. Because students do not actively practice, retrieving the information may be difficult for students..

References

Clark, C. C., & Mayer, R. E. (2011). *e-Learning and the science of instruction*. (Third ed.). San Francisco, CA: Pfeifer.