

We learn almost everything
by something called,
Trial and Error

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(4/2016 Version)

We can begin to learn about new things a lot of different ways

- Through a Teacher, Coach, or Parent



Adding and subtracting fractions
(Khan Academy)

<https://youtu.be/52ZIXsFJULI>

We can begin to learn about new things a lot of different ways

- Watching how others do something

The 7 Steps to the Perfect Baseball Swing

<https://youtu.be/7JSMEOv4dXQ>

How to Play Happy (From "Despicable Me 2") on the Guitar

<https://youtu.be/U592YQiHyGw>

5 Karate Exercises Kids Can Do at Home

<https://youtu.be/0N43e5fm0xc>

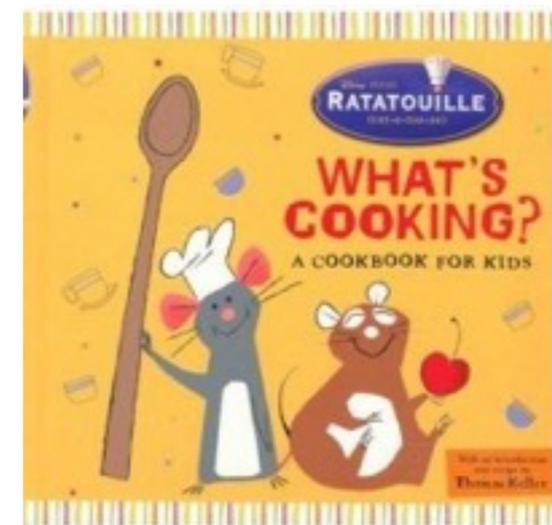
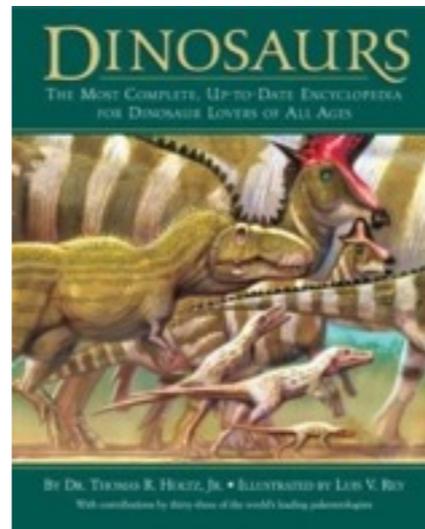
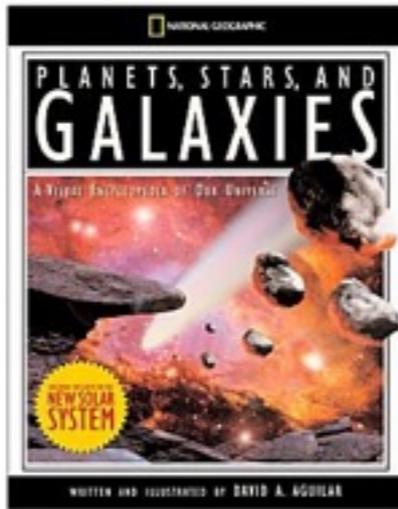
How to Build The Krusty Krab in Minecraft

<https://youtu.be/UPUg3zI-OI4>



We can begin to learn about new things a lot of different ways

- Reading



...but the way we learn the most is through something called, **Trial and Error**.

- Trial and Error means that we Try something, make an Error...
- Try it again and make another Error...
- Try it again...and make more Errors until we start getting it right.
- We keep trying and sometimes make Errors and sometimes get it right.
- Eventually, we begin getting it right more times that we make an Error. ***Errors still happen, but that's OK because they are needed, just like getting it right - to eventually learn.

Learning through Trial and Error

An classic example of learning through Trial and Error is when we learn to walk.

Simply do a search on [Google](#) or directly on [YouTube](#):

A child learning to walk for the first time.



[Time Lapse of Baby Learning to Walk](#)



Or do a search on [Google](#) / [YouTube](#):

Learning to ride a bike.

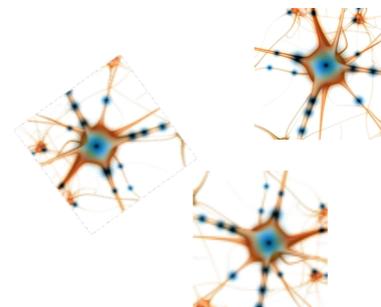
[Learn to Ride A Bike In 5 Simple Steps](#)

Why do we learn through Trial and Error ?

- Every time we try something, our brains record what is happening. The brain records the experience by *neurons connecting and making new pathways*.
- A young girl, who sounds like she is from England or possibly Scotland put together a nice video on **The Learning Brain**. When you watch it, especially pay attention to when the video reaches about 2:08 (two minutes and eight seconds) because that is when she talks about how the neurons connect when you learn. Neurons establishing connections through learning is discussed from 2:08 to 3:23

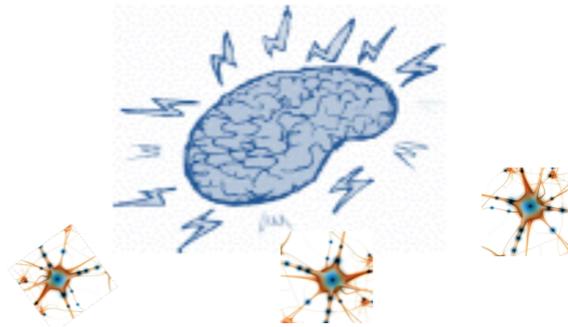


[The Learning Brain](#)



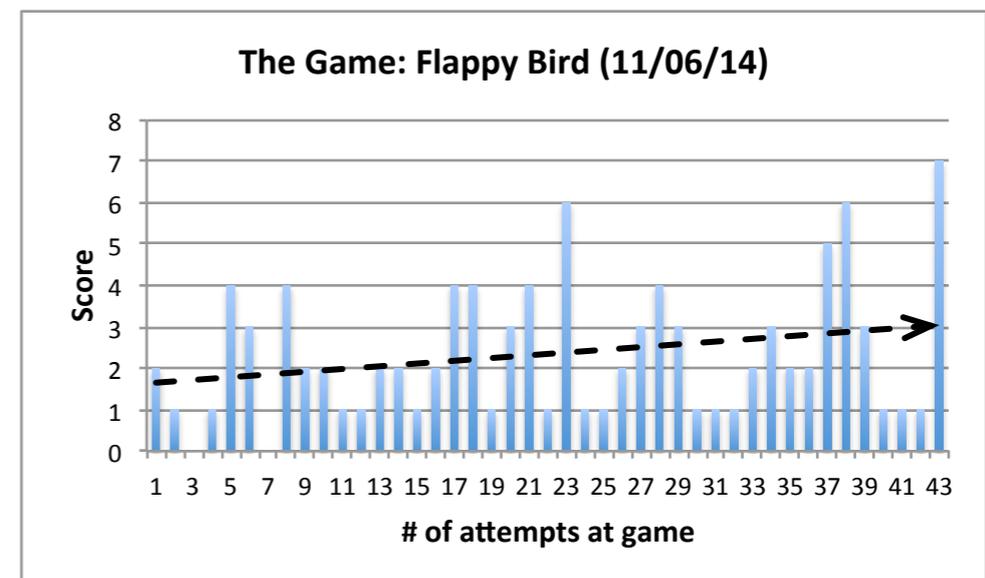
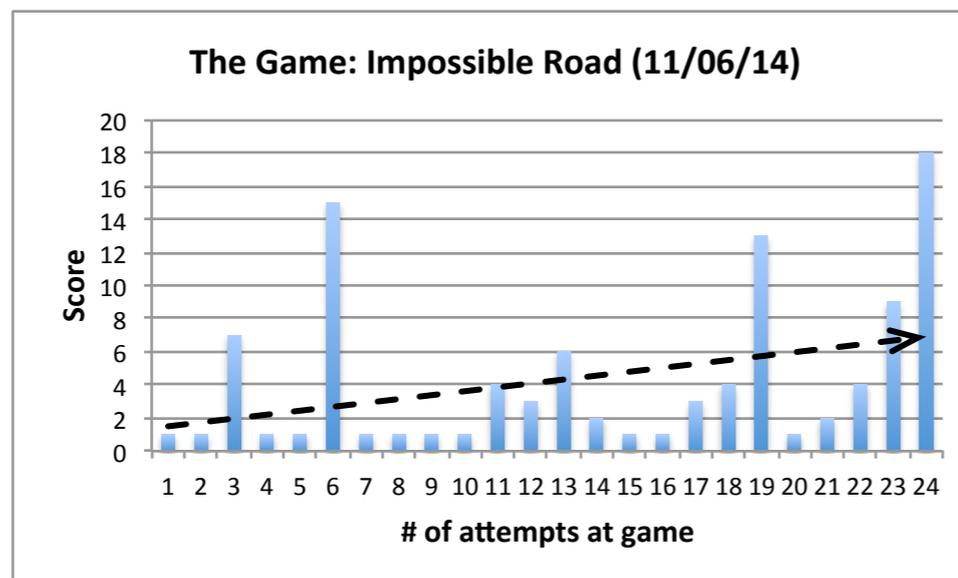
Learning through Trial and Error

- When watching **The Learning Brain** video we find out that the neurons make new connections when we try something over and over again. This means TWO things:
 1. The neurons connect **no matter what!** That means they connect when we we get it right *and* when we make Errors...which is a good thing because we might make a lot of Errors when we first try to learn something new.
 2. In order for Trial and Error to work, we have to just keep trying...the more times we try something, the more times the neurons will connect. Eventually, no matter what - we will always get better at something if we just keep trying and when we don't give up. That's how the brain works!



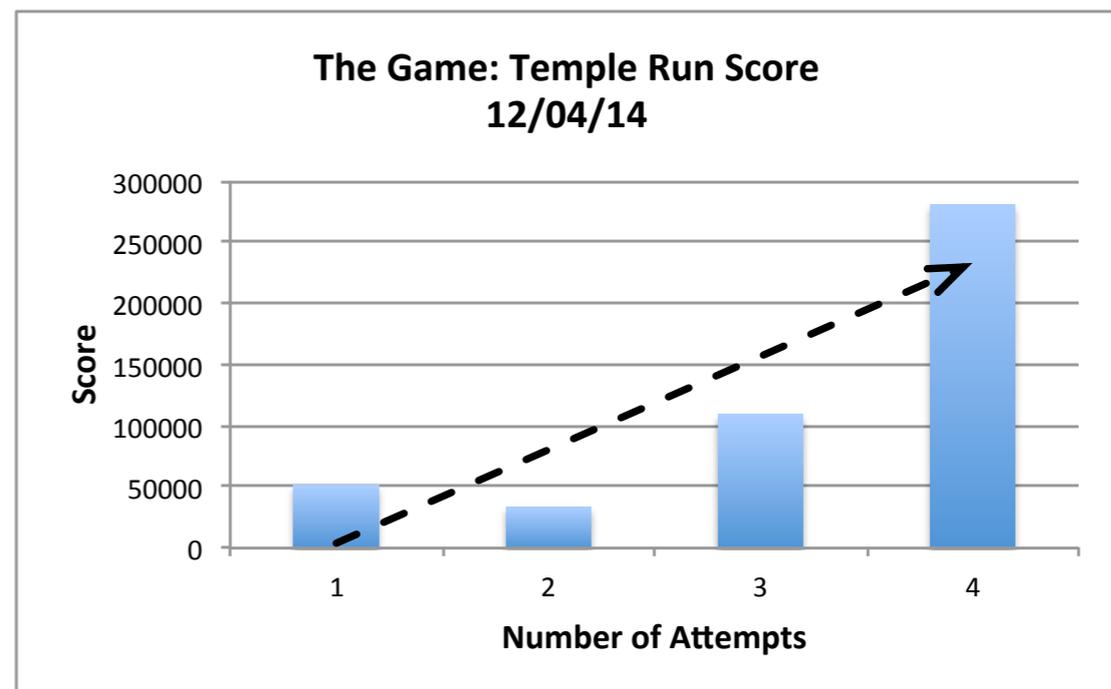
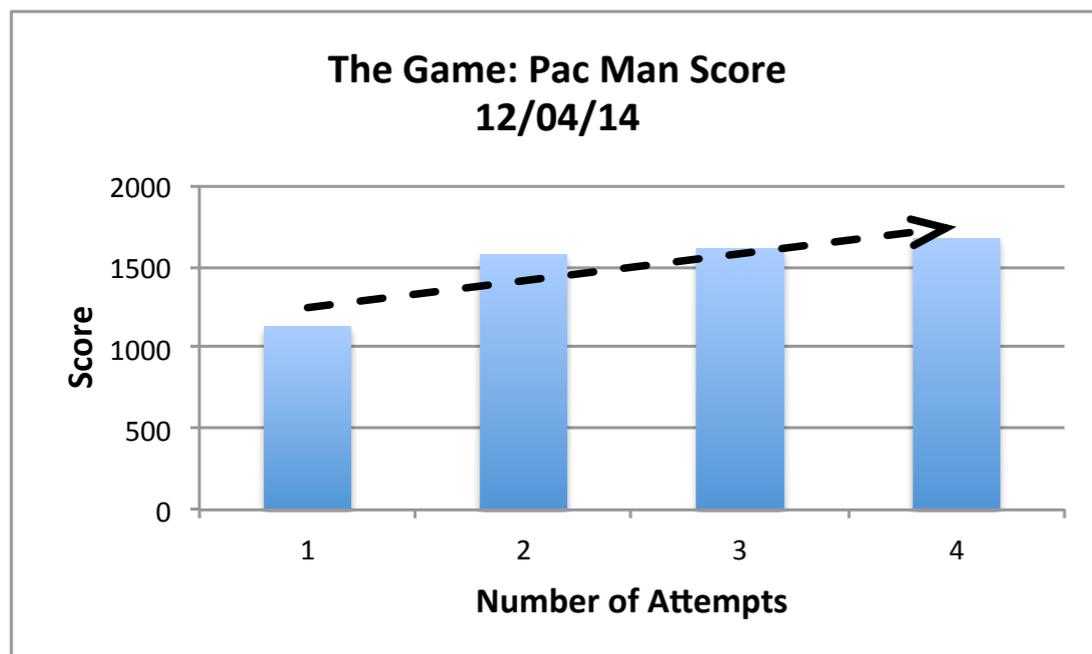
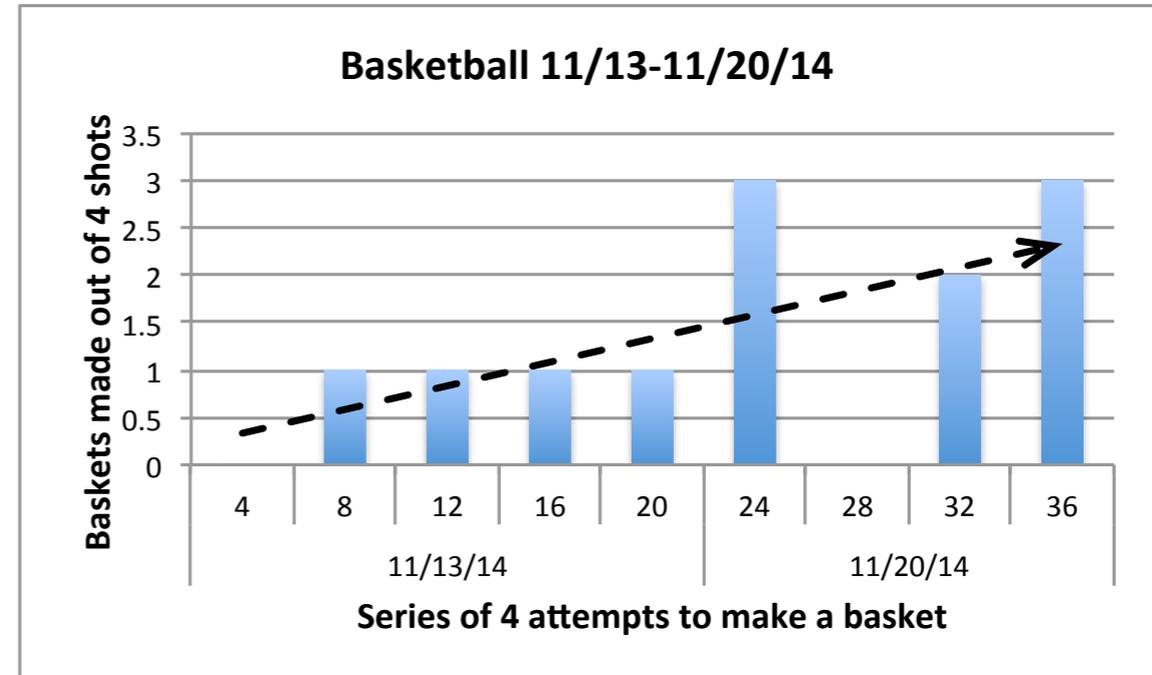
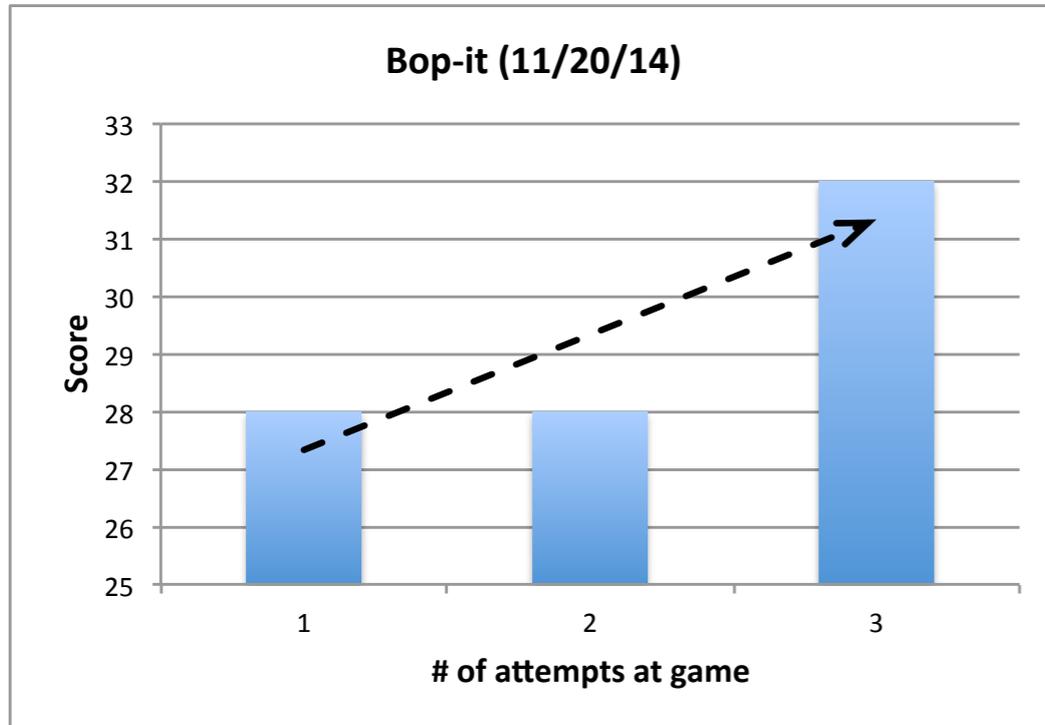
Real Examples of Trial and Error

- If we were to write down all the Errors and times when we get it right when we try something new, we would end up with a score sheet. And guess what the score sheet would show? The scores would show that eventually we get better. On this slide and ones to follow there are examples of different children trying different games - all learning something new and through Trial and Error (neurons connecting) - Everyone gets better!

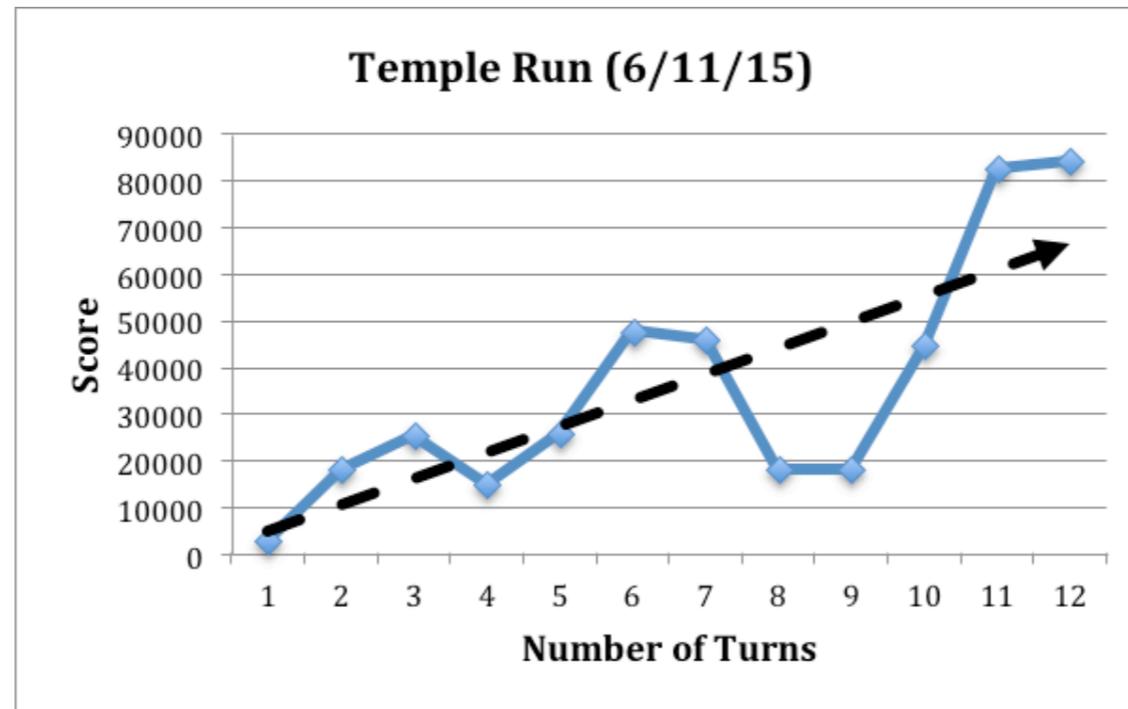
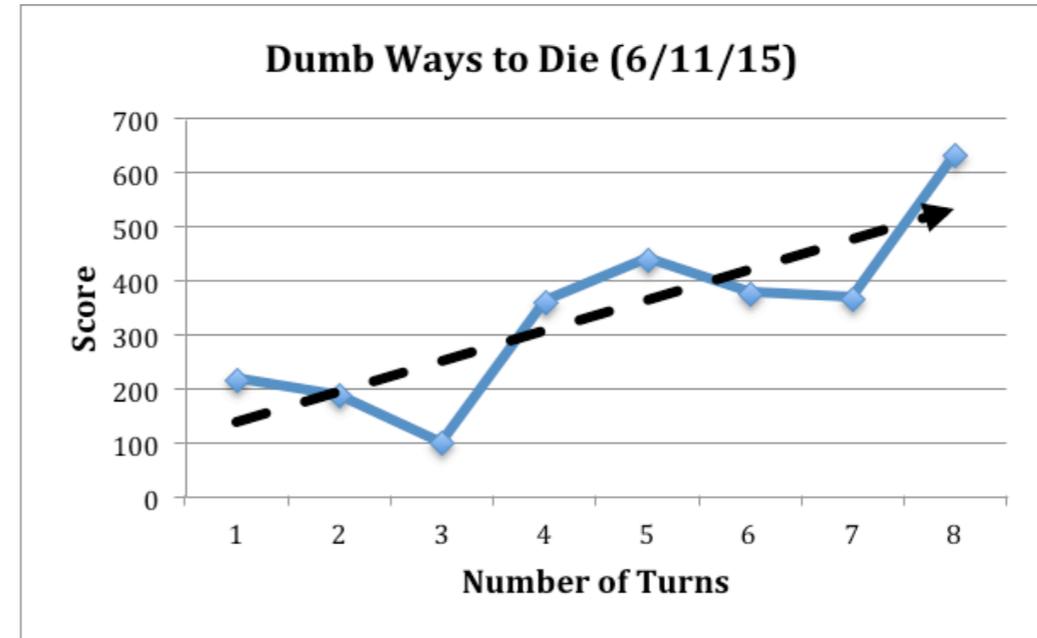
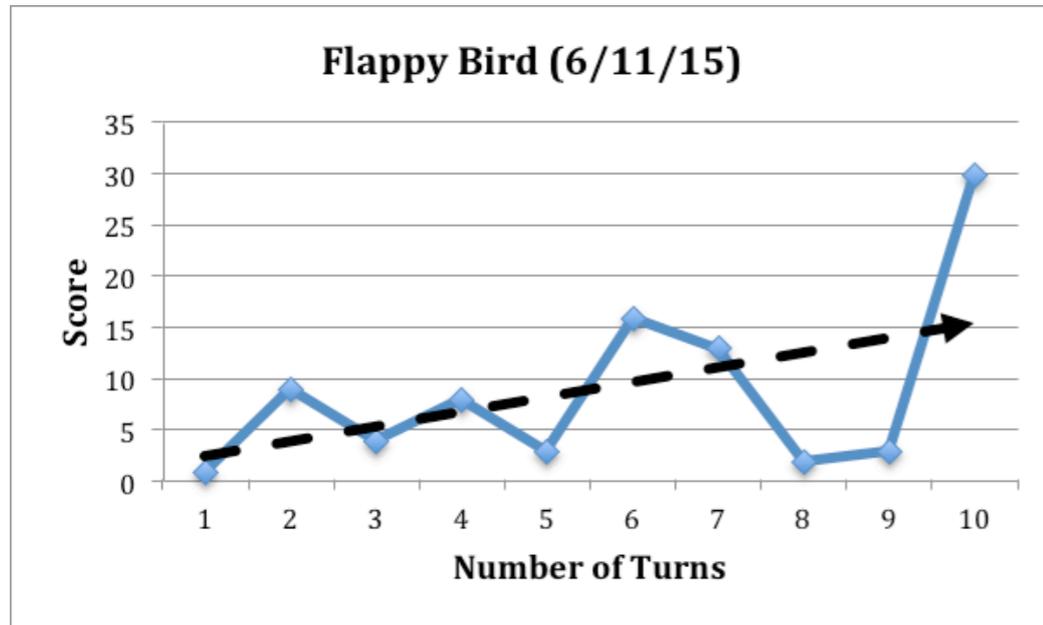


The scores go up (getting it right) and down (getting it wrong), but over time the person got better, which is shown by the dotted black line.

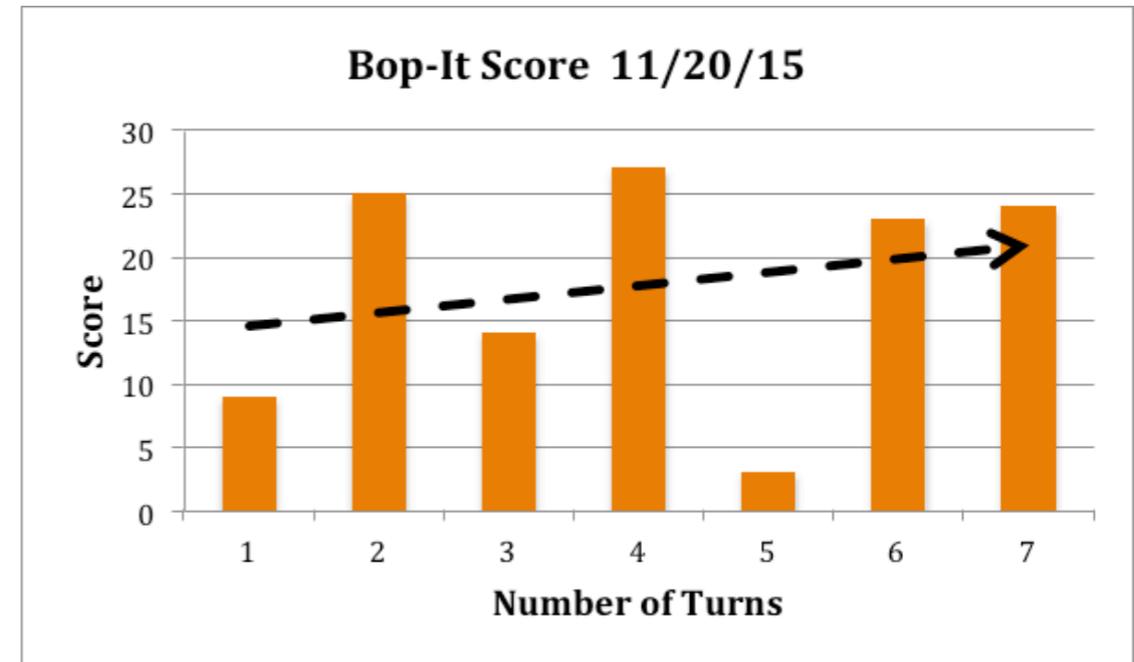
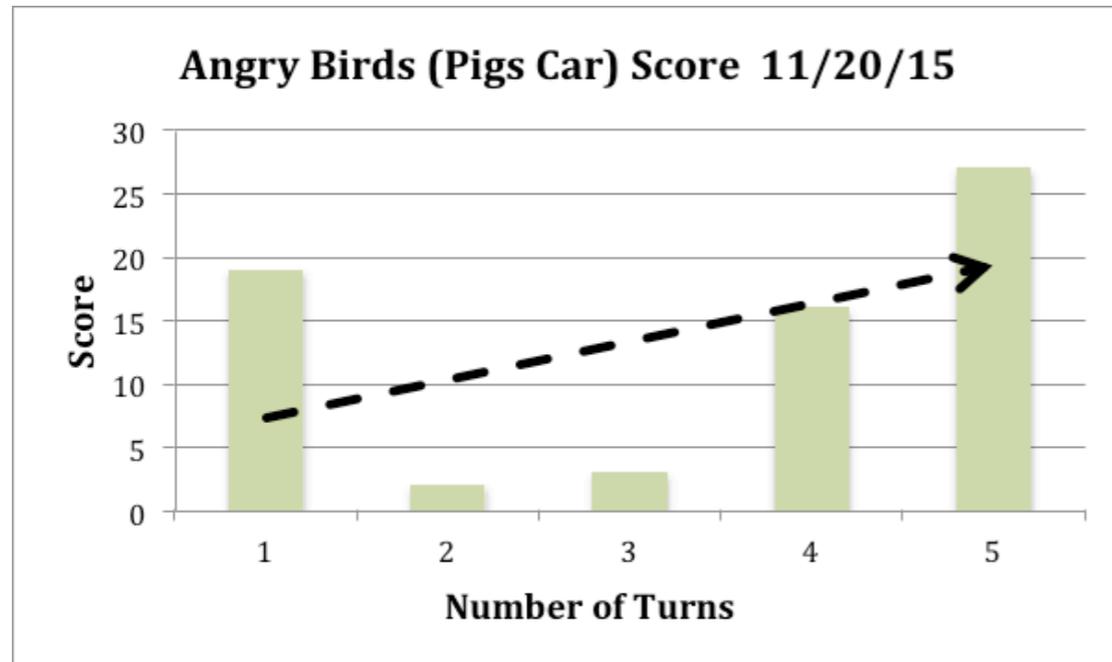
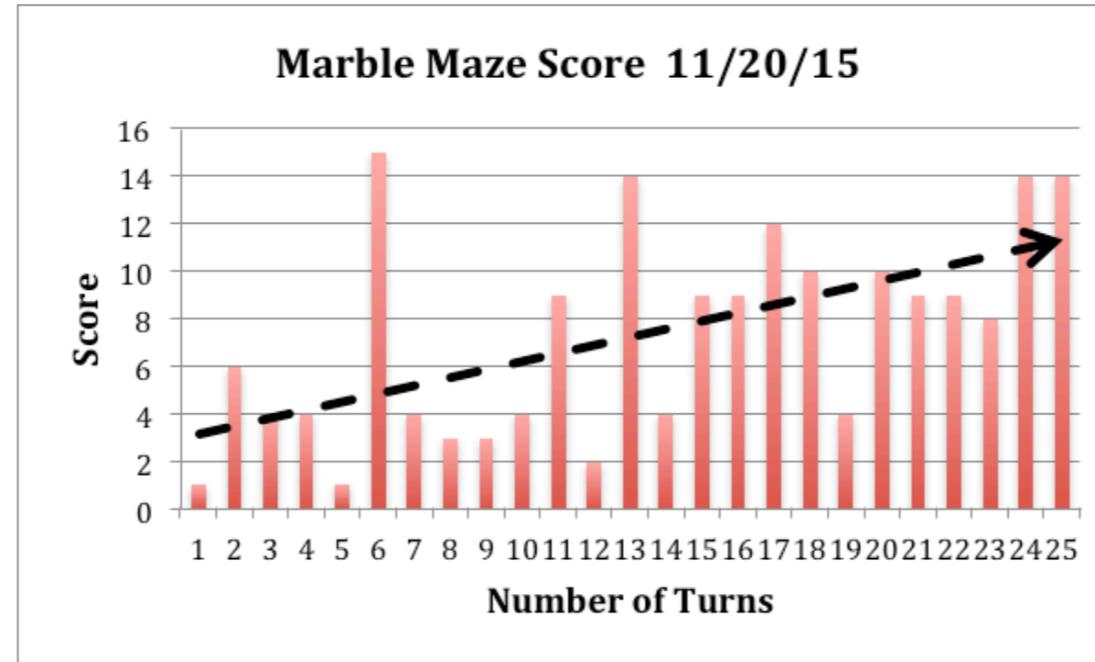
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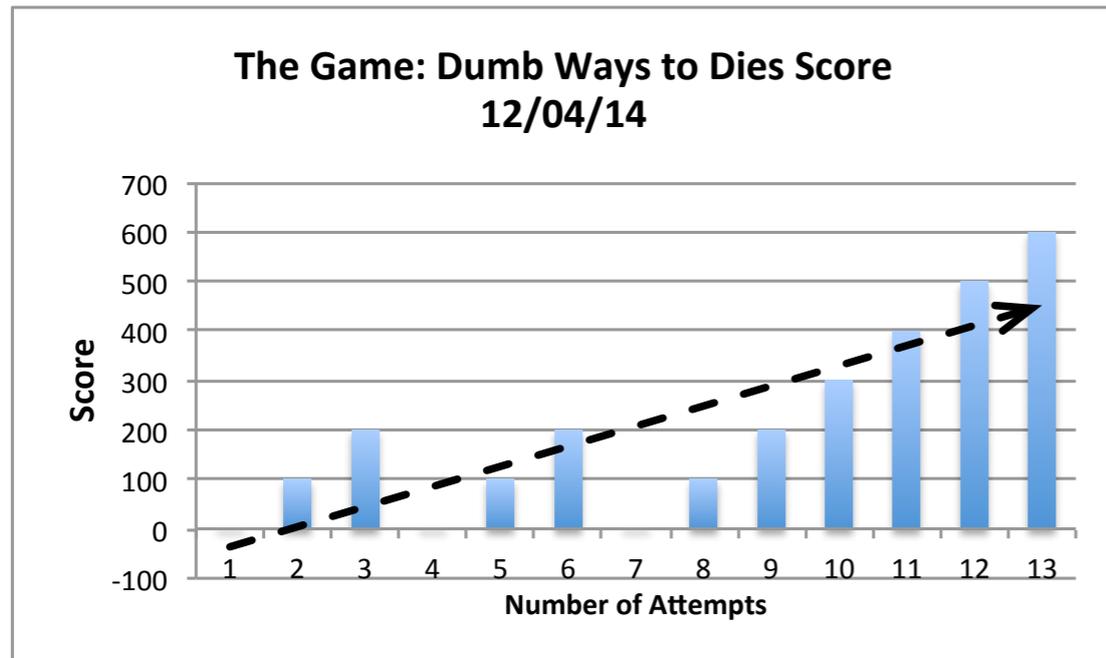
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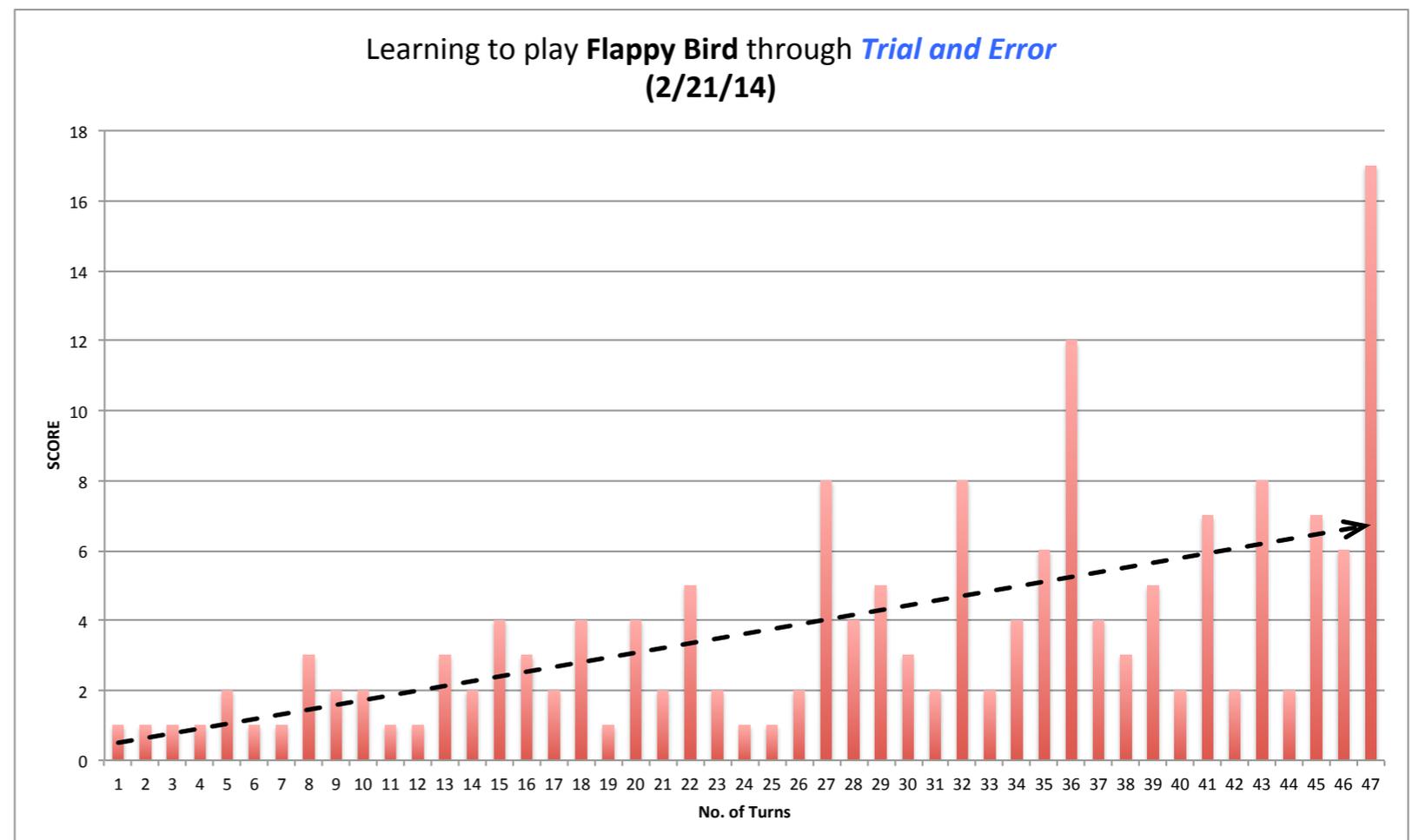
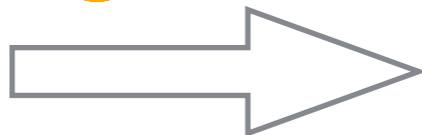
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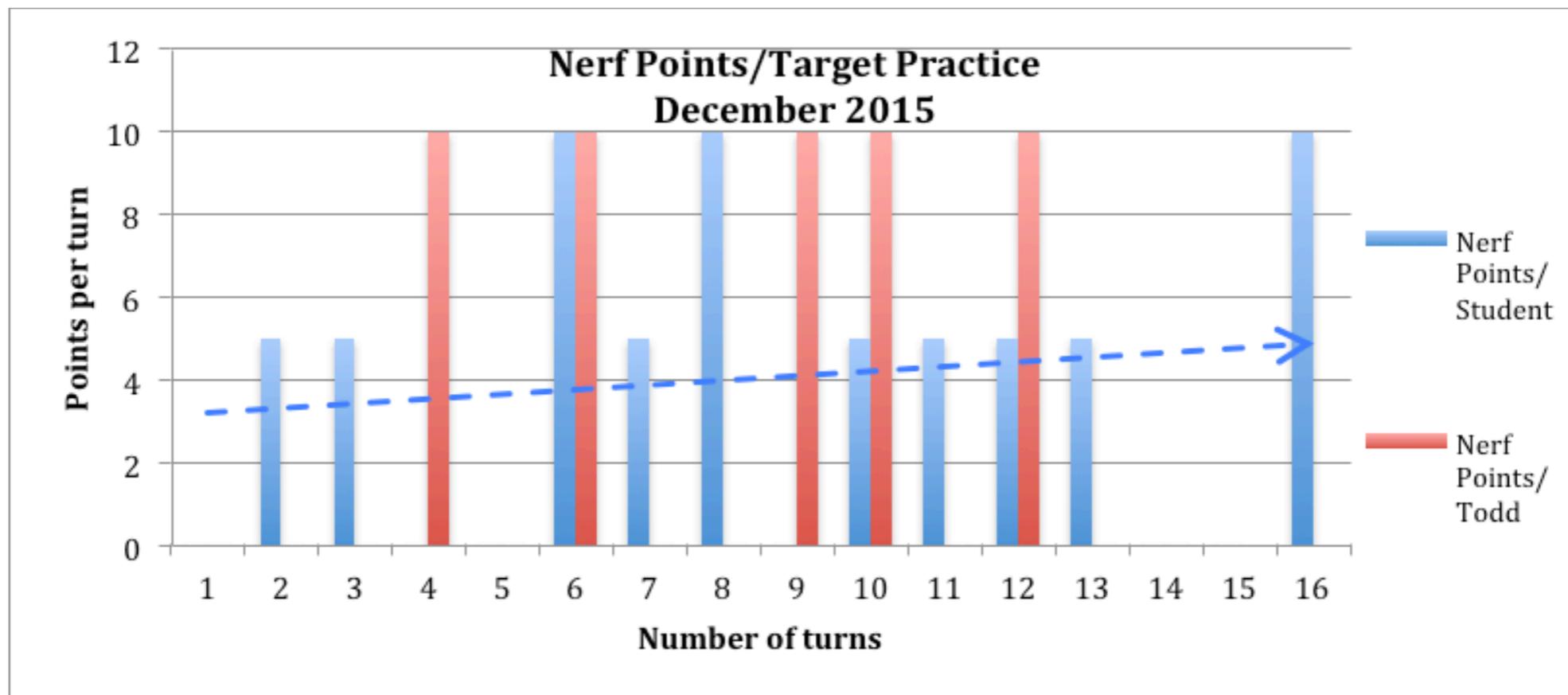
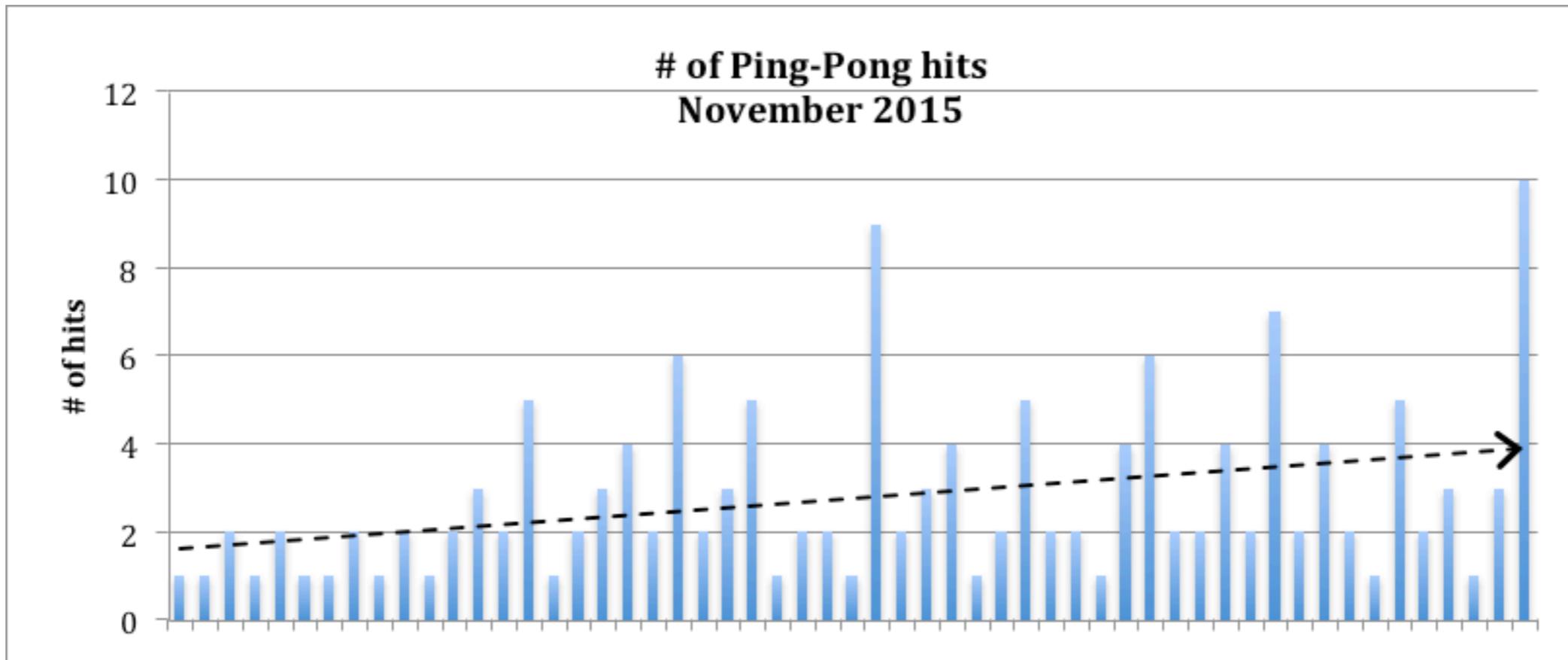
Real Examples of Trial and Error



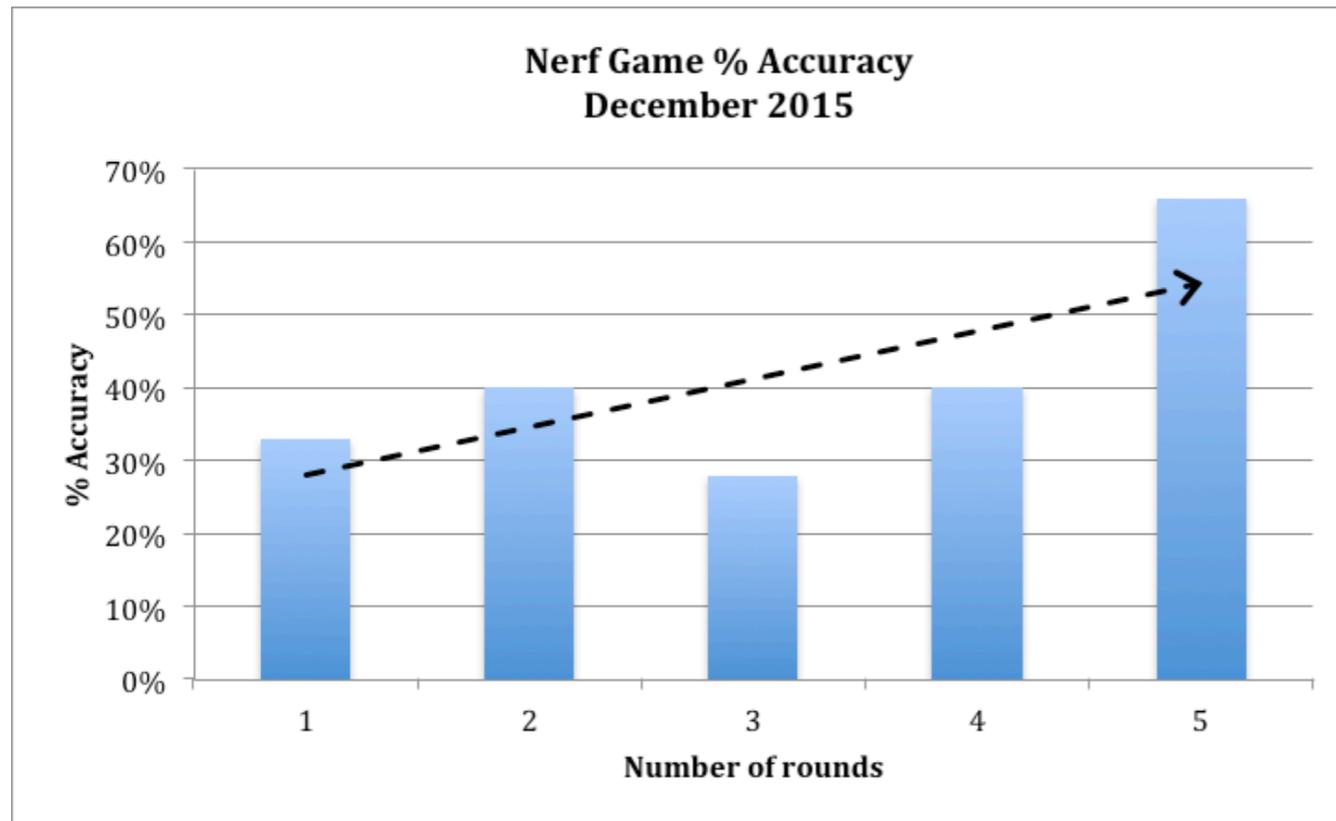
Even an Adult can learn to play a very hard video game if he just sticks with it!



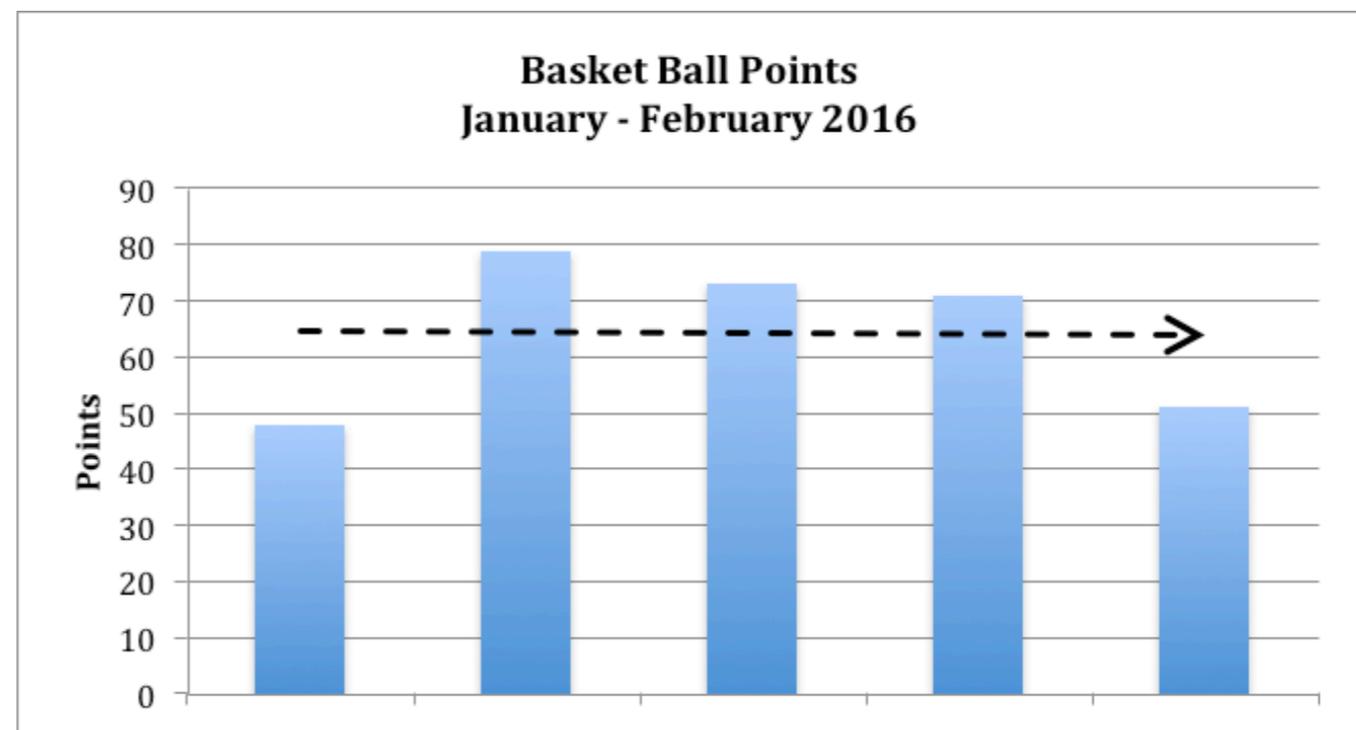
The Latest Examples of Trial and Error



The Latest Examples of Trial and Error



Sample size is not big enough yet. If he chooses to continue, then the trend line will eventually go up... showing that he would be getting better over time.



One more thing....

- What can get in the way of learning with Trial and Error?
 - *Giving up* 
- If we get too upset because we are making errors, then the neurons will not fire-up and connect around getting better at what we are trying to learn. Instead the neurons will connect around sad and angry thoughts with the activity that we are supposed to learn. That can keep us from learning.
- And giving up means we no longer give our brains a chance to figure it out.
- Let's check out **The Learning Brain** video again, but this time about how stressing out over our mistakes can make it very difficult to learn. See 3:32 to 4:08.  [The Learning Brain](#)
- So whatever we do...we need to remember that **Trial and Error is how we learn** and so there is *no need to get upset* with the Errors, because the neurons connect with the Errors just like they connect when we get it right!

Some examples of things that I **already** learned to do because of *Trial and Error*

Some examples of things that I **could** learn to do (better) *if* I allow myself to **keep trying** (*Trial*) and to make mistakes (*Error*)



For Parents, Teachers, Coaches, and Therapists

“A few modern philosopher’s assert that an individual’s intelligence is a fixed quantity, a quantity which cannot be increased. We must protest and react against this brutal pessimism.... With practice, training, and above all, method, we manage to increase our attention, our memory, our judgment and literally to become more intelligent than we were before.”

Alfred Binet, the inventor of the IQ test.

Angela Lee Duckworth: The key to success? *Grit*

TED Talk: http://www.ted.com/talks/angela_lee_duckworth_the_key_to_success_grit.html

- o To work hard and long enough...from a motivational perspective
- o So what do you do when you are *not* learning quickly and easily: *Keep trying or Give up.*
- o One characteristic above the others in determining success: **Grit**
- o Definition of Grit: *Stamina, passion and determination for long-term goals.*

How to build Grit in kids?...To build a Solid work ethic....How to keep a child motivated long enough:

Growth Mindset

♣ <http://mindsetonline.com>

♣ <http://mindsetonline.com/whatisit/about/>

♣ <http://www.mindsetworks.com/default.aspx>

- ♣ Dr. Carol Dweck: Studied how the brain changes over time when faced with challenges that require effort, mistakes, and persistence (i.e., **Trial and Error**)
- ♣ One needs to understand and accept that *Failure* is not a permanent event.
- ♣ Being willing to fail; be wrong, and to Start Over...again and again.
- ♣ To have the Love of Learning
- ♣ Teaching Motivation and Productivity
- ♣ “...no one has ever accomplished great things—not Mozart, Darwin, or Michael Jordan—without years of passionate practice and learning.” [**Trial and Error**]