

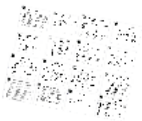

Eight elements of divergent thinking:
CHOOSE A TOOL YOU CONSIDER THE MOST USEFUL!



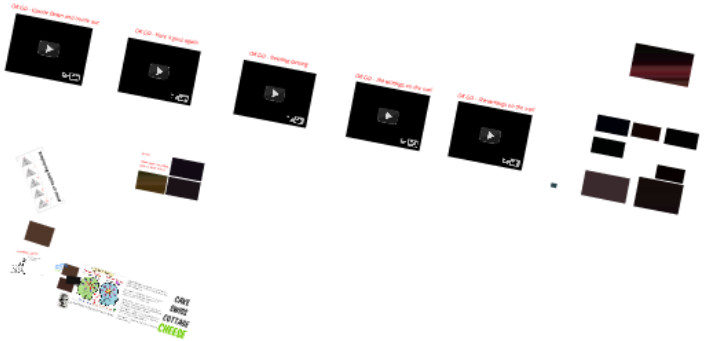









16


CAN
DRAW
OUTSIDE
CREEDS

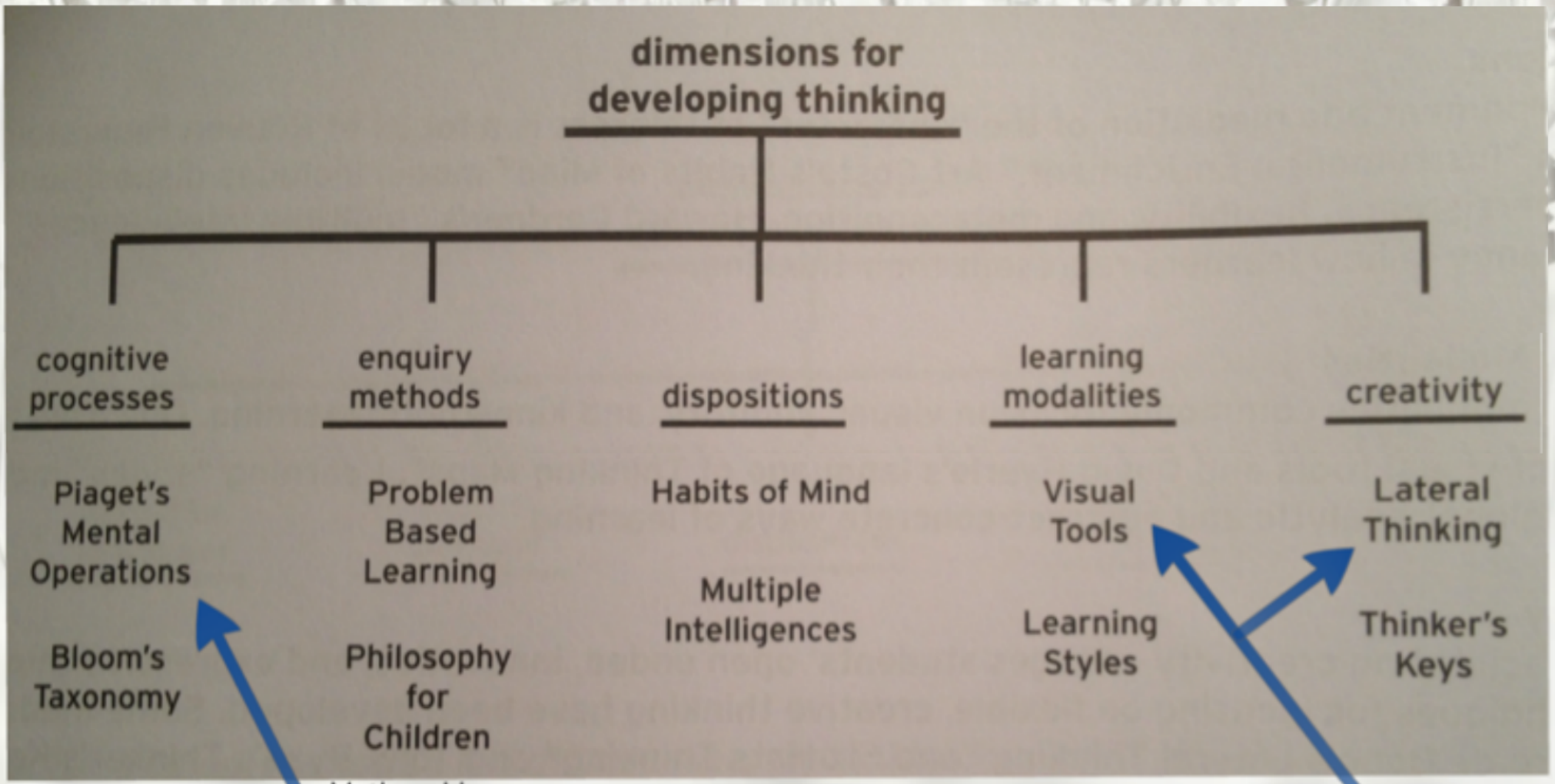
Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Yr Athrofa
Institute of Education
Addysg i Gymru Education for Wales

ECAD6011C

You don't 'think' of an idea you 'find' it!

OKGO, ideas generation...and walking!



Comparison/ categorisation/ cause-effect reasoning.

What would be an example?

The 16 Habits of Mind


















The 16 Habits of Mind

1. Persisting



2. Managing Impulsivity



3. Listening with understanding & empathy



4. Thinking Flexibly



5. Thinking about thinking (metacognition)



6. Striving for accuracy



7. Questioning and posing problems



8. Applying past knowledge to new situations



9. Thinking & communicating with clarity and precision



10. Gathering data through all senses



11. Creating, imagining, innovating



12. Responding with wonderment and awe



Can you make connections to ANY aspects of session so far?

13. Taking responsible risks



14. Finding humour



15. Thinking interdependently



16. Remaining open to continuous learning



Can you make connections to ANY aspects of session so far?

Thinking about Thinking

- Know what they _____ and what they don't ____.
- Can plan a _____ to produce the needed result.
- Are aware of the _____ they are going through to solve a problem,
- _____ on the process they went through judging how effective they were.
- Aware of the effect their _____ have on themselves, others and the environment.
- _____ what they would make if they were to do a similar activity again.

Responding with Wonderment and Awe

- Look for _____ problems to solve because they enjoy it.
- Enjoy _____ their own problems.
- _____ learning!
- Can see _____ in everything around them.
- Are curious about _____.

Listening to Others with Understanding and Empathy

- Listen to others without _____ with other information.
- Can _____ what the person has said in their own words.
- Detect how other people are _____ by the way they speak and behave and respond _____.
- Can _____ to try and get a better understanding of what the person is saying.
- Can see the situation through the other person's eyes despite _____.

Gathering Data through all the Senses

- Know that all information gets into their brain through their _____.
- Are _____ to information that is around them to be gathered through the senses.
- Are willing to use ___ their senses to _____ something – not just one or two.

Thinking and Communicating with Clarity and Precision

- Speak about their ideas in a way that is very easy to _____ and straight to the point.
- Use the correct _____ for things.
- They do not overgeneralise, delete or _____ sections of information.
- Justify clearly why they ____ a certain way.

Striving for Accuracy and Precision

- Take time to _____ their work to get the best possible results.
- They are very aware of the expectations of them and the _____ they need to meet.
- Confirm that their work exactly meets the _____ of the lesson.
- Take _____ in their work.
- Rework projects _____ decide do not meet the required standard.
- Don't go for the _____ answer but instead go for the best.

Learning Continuously

- Constantly _____ for new and better ways to do things.
- Try to improve them.
- Treat all experiences as learning _____.
- Realise that there is always more to learn so are not _____ to new learning situations.
- Know that asking new _____ is more valuable than _____.

Finding humour

- Can look at _____ from original and interesting angles.
- Look for _____ in _____ situations.
- _____ the humour of others.
- Play with _____ to find humour.
- Can see the absurdness of _____.
- Are able to laugh at _____.

Thinking Flexibly

- Can change their mind when they receive new _____.
- Can work on _____ activity at a time flicking from one to the other.
- Try to think of _____ ways to solve problems.
- Can see things from many_____.
- Can see the _____ as well as the smaller details.

Questioning and Posing Problems

- Know what _____ to ask to find out the information they need.
- Ask a range of questions to get a more _____ of their topic.
- Don't accept everything they are told by asking how the information _____.
- Ask _____ questions - what might happen if…

Managing Impulsivity

- _____ before they act.
- _____ how they are going to get to a goal before _____.
- Don't make _____ judgements about an idea despite their own personal views.
- Consider _____ and _____ to their ideas before beginning.
- Take _____ to _____ on an answer before giving it.
- Listen to other points of _____.

Applying Past Knowledge to New Situations

- Think about what they have _____ in the past to help them ____ a new problem.
- Use information gained in the past to _____ and explain their actions in the present.
- Can take concepts they have used in the past and _____ them to a completely different type of problem.
- Use knowledge from the past and make _____ with new concepts they are learning in the present.

Thinking Interdependently

- Know that a _____ can achieve more than an _____.
- Are _____ to the needs and feelings of others.
- Know that no one person has all the _____.
- Can _____ their ideas but are willing to _____ their ideas after listening to others.
- Are willing to receive _____ and _____ feedback from others.
- Can listen carefully to others and work to reach _____ with the group.
- _____ others in the group.

Taking Responsible Risks

- Push themselves past where they feel _____ to achieve goals.
- Accept that _____ is part of learning and will give things a go despite the chance of failing.
- View _____ as an interesting challenge that help them to find out more about the way they learn.
- Are aware of the _____ of taking the risk and know which ones are not worth taking.

Persisting

- Stick to a task until it is _____.
- Don't _____easily.
- Have a range of _____ to try and solve a problem.

Creating, Imagining and Innovating

- Try to solve problems in a new and _____ way.
- Examine problems from many _____ and think of alternatives.
- Take _____ and push themselves.
- Work on tasks because they _____ it not because they might get a _____.
- Are open to _____ – they want to know what other people think.
- Know that being _____ is something you work at, not something you are born with.



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Teaching Creatively

What's the difference?

National Advisory Committee on Creative and Cultural Education (NACCCE, 1999)

N.A.C.C.C.E. (1999) All our futures: creativity, culture and education (London, DfEE).

Define?

Teaching for Creativity

innovation

Ownership

Control

Relevance

Woods (1990)

Teaching Creatively

'using imaginative approaches to make learning more interesting and effective' (ibid. p. 89).

What's the difference?

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Relationship?



Met

Define?

Teaching for Creativity

Forms of teaching that are intended to develop young peoples own creative thinking or behaviour.

Woods (1990)

ches to make learning
tive' (ibid. p. 89).

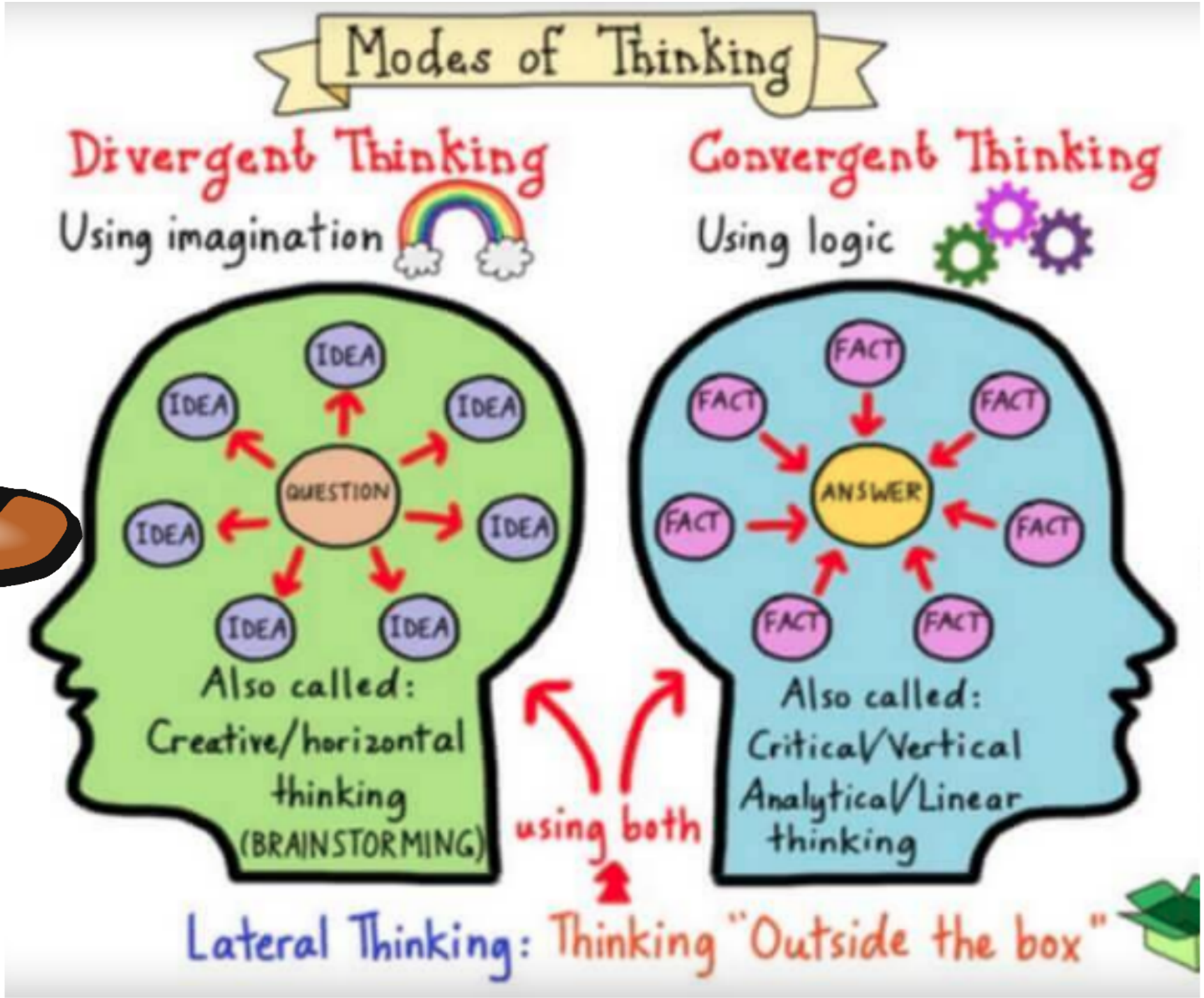


re intended to develop
tive thinking or behaviour.

How is life like a train journey?

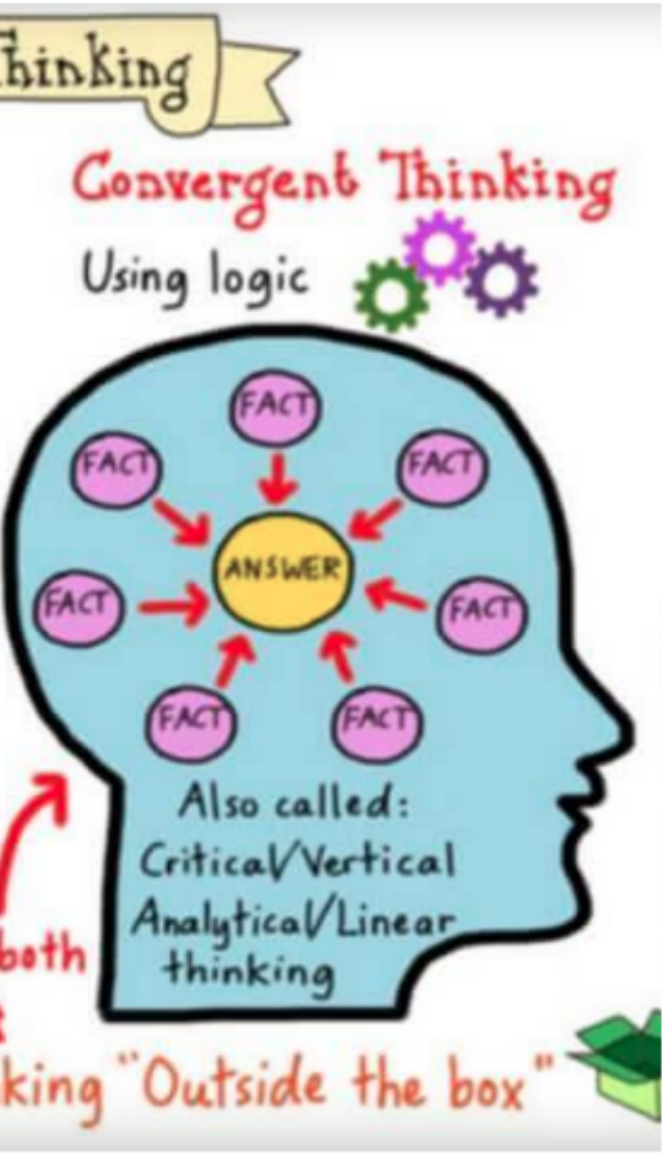
Metaphorical Thinking




Modes of Thinking
Divergent Thinking
Using imagination
Convergent Thinking
Using logic
IDEA
IDEA
IDEA
QUESTION
IDEA
IDEA
IDEA
IDEA
FACT
FACT
FACT
ANSWER
FACT
FACT
FACT
FACT
Also called:
Creative/horizontal thinking
(BRAINSTORMING)
using both
Also called:
Critical/Vertical
Analytical/Linear
thinking
Lateral Thinking: Thinking "Outside the box"

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ned the phrases.

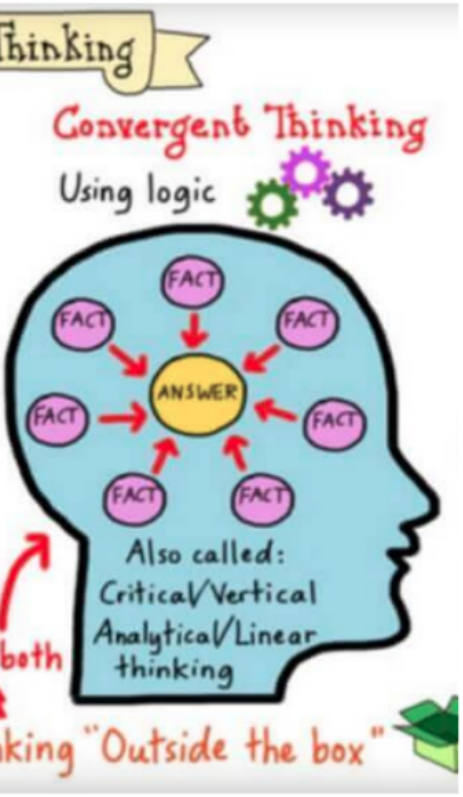
'It generally means the ability to give the "correct" answer to standard questions that do not require significant creativity.

Convergent thinking is the type of thinking that focuses on coming up with the single, well-established answer to a problem.

When an individual is using critical thinking to solve a problem they consciously use standards or probabilities to make judgments.

Convergent thinking, follows a particular set of logical steps to arrive at one solution, which in some cases is a 'correct' solution.

Convergent thinking is used as a tool in creative problem-solving.



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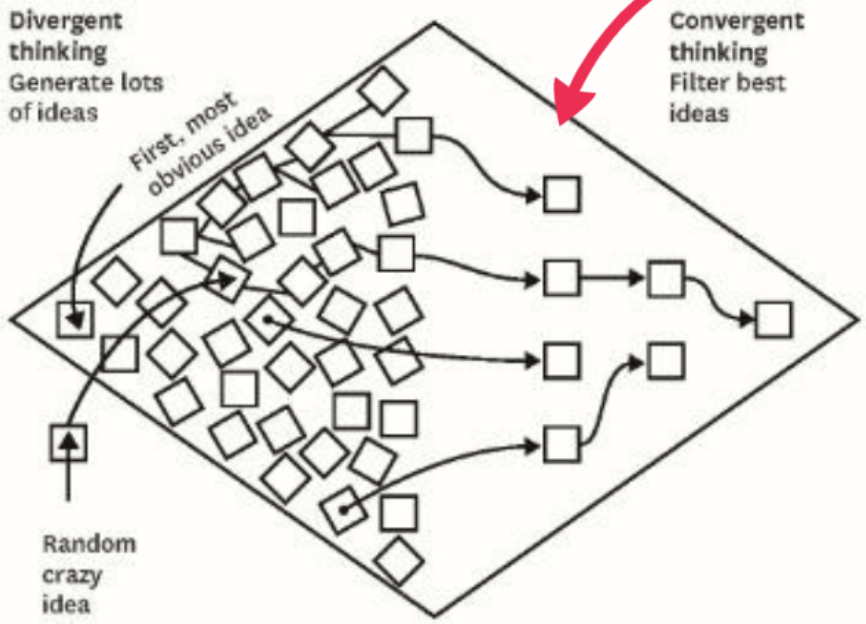
Convergent thinking is used as a tool in creative problem-solving.

CAKE
SWISS
COTTAGE
CHEESE

The Game



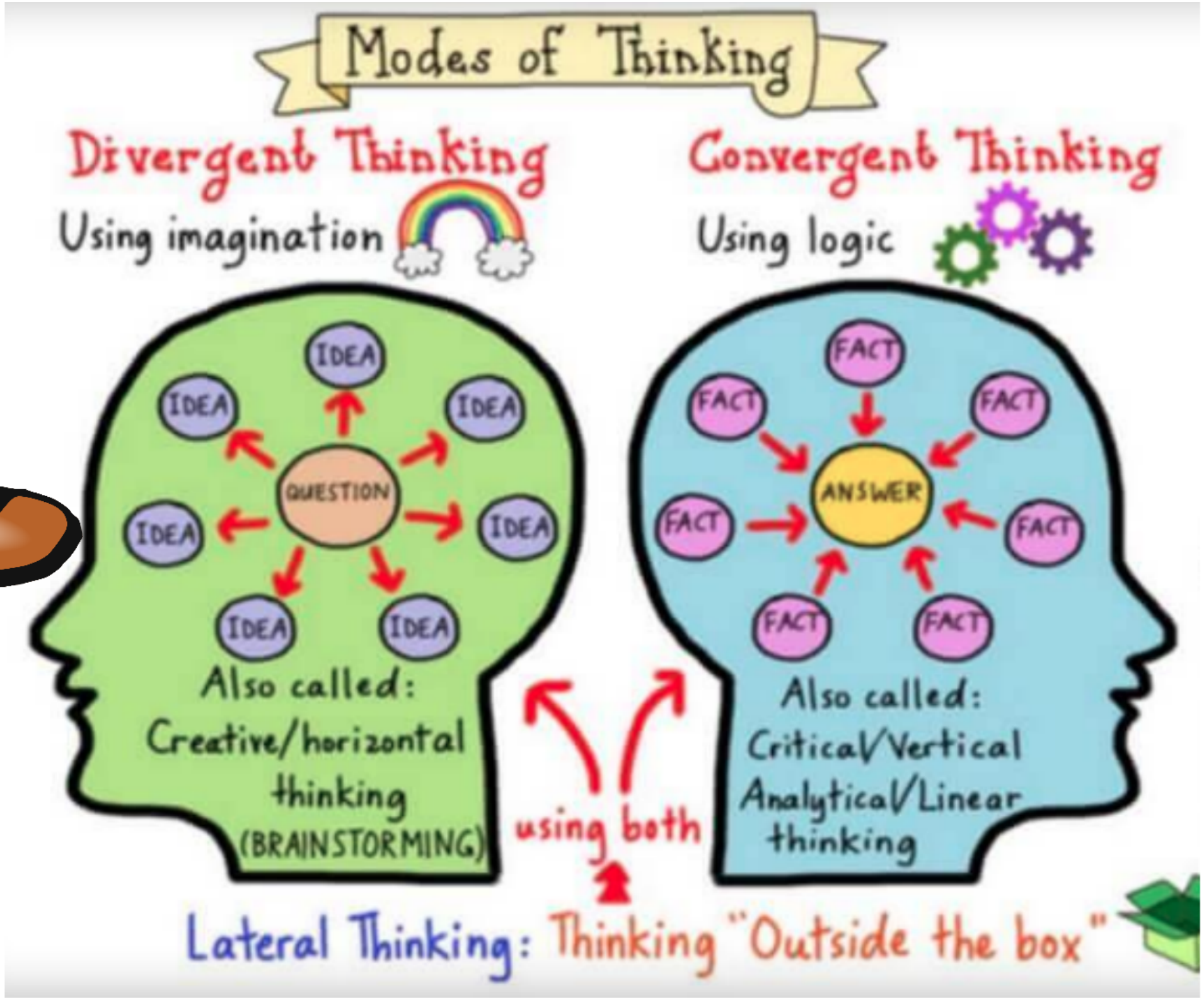
List of brainstormed ideas about TV on your tables



Your task is to practice convergent thinking by grouping similar ideas together.

Look for thoughts or ideas that appear to fit together, then identify the category or group these ideas represent.

Give a label or "heading" to each of the categories you identify. You should identify 3 - 5 categories.

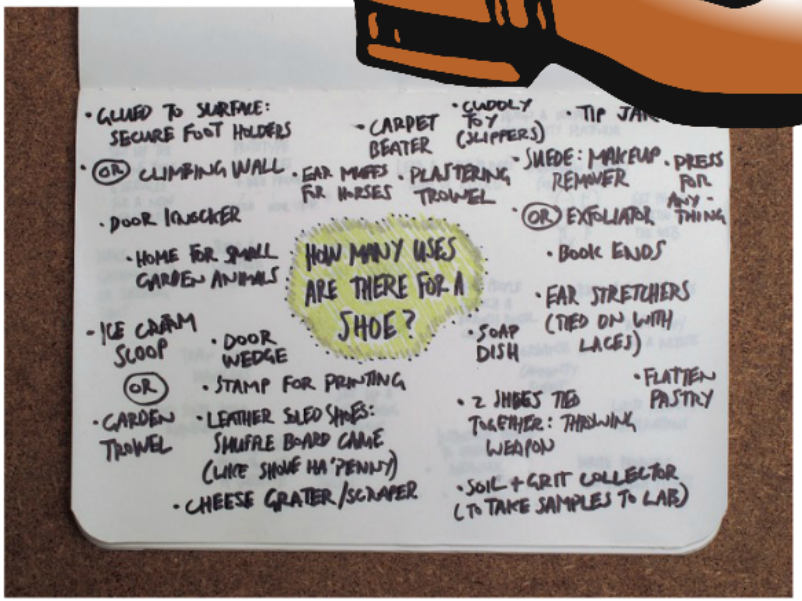

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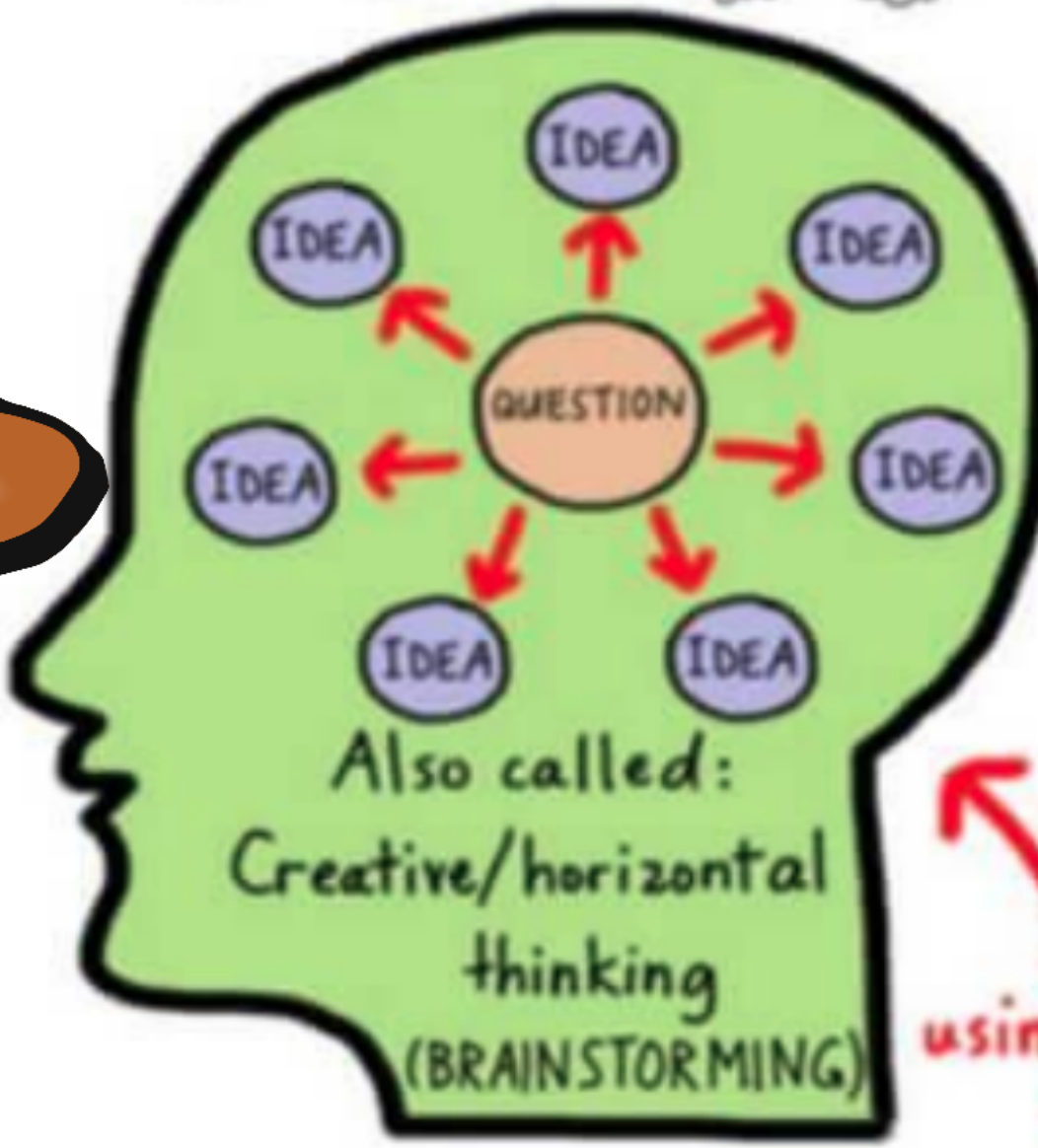




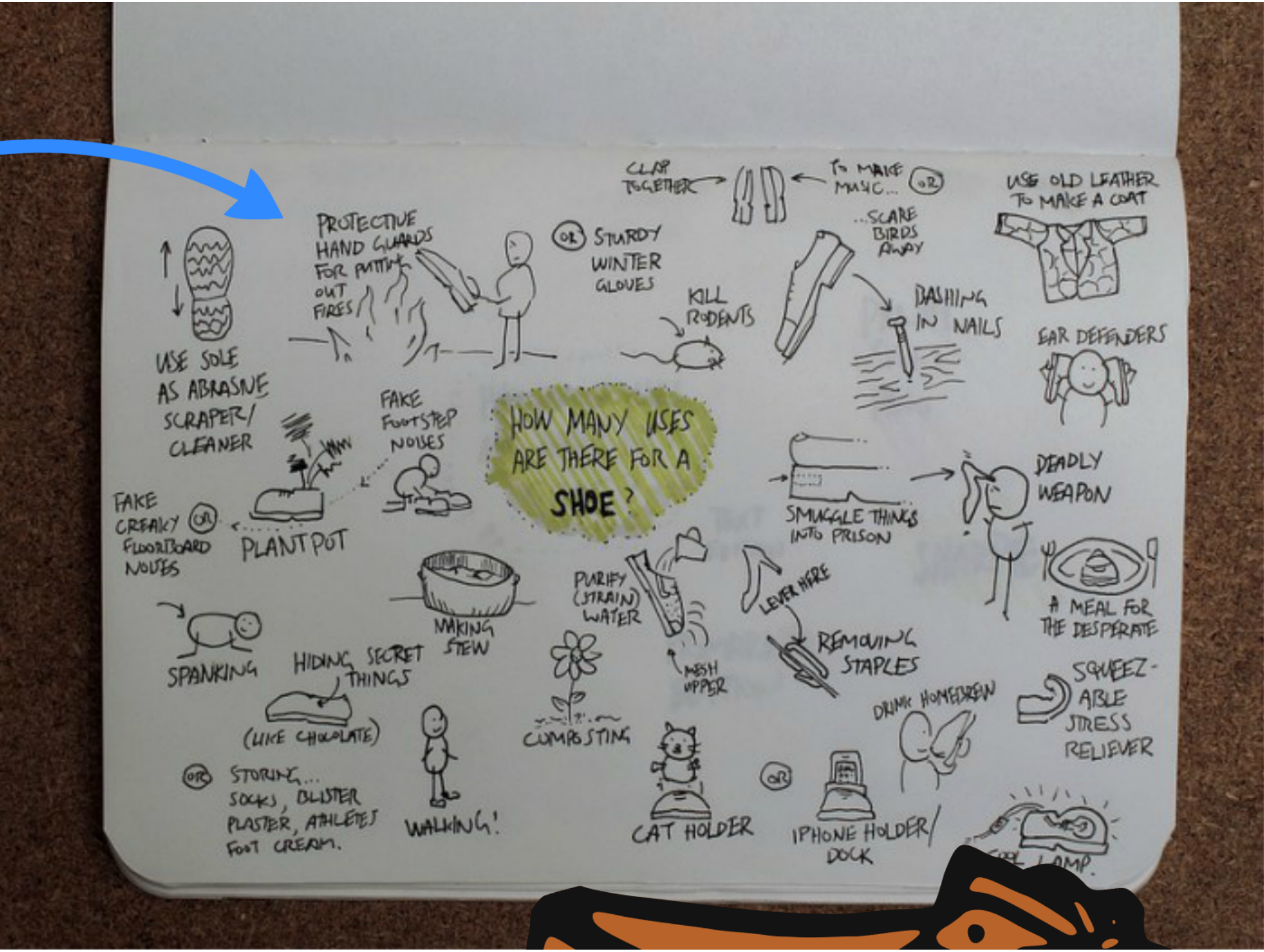
Divergent Thinking

Using imagination





usin


HOW MANY USES ARE THERE FOR A SHOE?
USE SOLE AS ABRASIVE SCRAPER/ CLEANER
PROTECTIVE HAND GUARDS FOR PUTTING OUT FIRES
OR STURDY WINTER GLOVES
CLAP TOGETHER
TO MAKE MUSIC...
OR
USE OLD LEATHER TO MAKE A COAT
...SCARE BIRDS AWAY
KILL RODENTS
BASHING IN NAILS
EAR DEFENDERS
FAKE FOOTSTEP NOISES
FAKE CREAKY FLOORBOARD NOISES
OR
PLANT POT
SMUGGLE THINGS INTO PRISON
DEADLY WEAPON
A MEAL FOR THE DESPERATE
MAKING STEW
PURIFY (STRAIN) WATER
MESH UPPER
LEVER HERE
REMOVING STAPLES
SPANKING
HIDING SECRET THINGS
(LIKE CHOCOLATE)
COMPOSTING
DRINK HOLDER
SQUEEZ-ABLE STRESS RELIEVER
OR STORING... SOCKS, BLISTER PLASTER, ATHLETES FOOT CREAM.
WALKING!
CAT HOLDER
OR
IPHONE HOLDER/ DOCK
LAMP.

HOW CAN WE ASSESS THIS?

HAVE A GO!



Eight elements of divergent thinking:

Originality – The skill of coming up with fresh, unusual, unique, extremely different or completely new products or ideas;

Complexity – The capacity to conceptualize difficult, multifaceted, many layered or intricate products or ideas;

Curiosity – The personality characteristic of displaying probing behaviors, searching, asking questions, learning to get more knowledge/information about something, and of being able to go deeper into ideas

Imagination – The capability of dreaming up, inventing, or to think, to see, to conceptualize novel products or ideas, to be original;



Elaboration – The skill of adding to, building off of or embellishing a product or an idea;

Flexibility – The capability of creating varied perceptions or categories where from come a range of different ideas pertaining to the same thing or problem;

Risk-taking – The readiness to be courageous, daring, adventuresome – take risks or experiment with new things so as to stand apart.

Fluency – The skill of engendering many ideas so as to have an increase in the number of potential solutions or associated products;

CHOOSE 4 THAT YOU CONSIDER THE MOST USEFUL!

TORRANCE (1966,1974) DESCRIBED FOUR COMPONENTS BY WHICH INDIVIDUAL CREATIVITY COULD BE ASSESSED:

FLUENCY: THE ABILITY TO PRODUCE A LARGE NUMBER OF IDEAS

FLEXIBILITY: THE ABILITY TO PRODUCE A LARGE VARIETY OF IDEAS

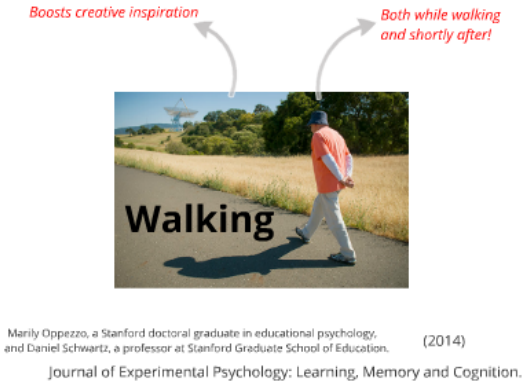
ELABORATION: THE ABILITY TO DEVELOP, EMBELLISH, OR FILL OUT AN IDEA

ORIGINALITY: THE ABILITY TO PRODUCE IDEAS THAT ARE UNUSUAL, STATISTICALLY INFREQUENT, NOT BANAL OR OBVIOUS.

WHAT IF EACH WERE MARKED OUT OF 10? HOW MUCH FOR THE SHOE GAME GET?

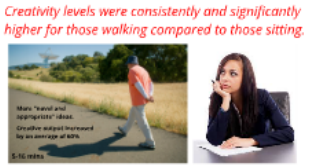
Idea Generation





Marily Oppezzo, a Stanford doctoral graduate in educational psychology, and Daniel Schwartz, a professor at Stanford Graduate School of Education. (2014)

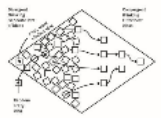
Journal of Experimental Psychology: Learning, Memory and Cognition.



They tested participants on things like coming up with alternate uses for everyday items.



The act of walking itself, and not the environment.



Oppezzo said, the benefits of walking applied to the "divergent" element of creative thinking, but not to the more "convergent" or focused thinking characteristic of insight.



Productive creativity involves a series of steps – from idea generation to execution

Boosts creative inspiration

Both while walking and shortly after!

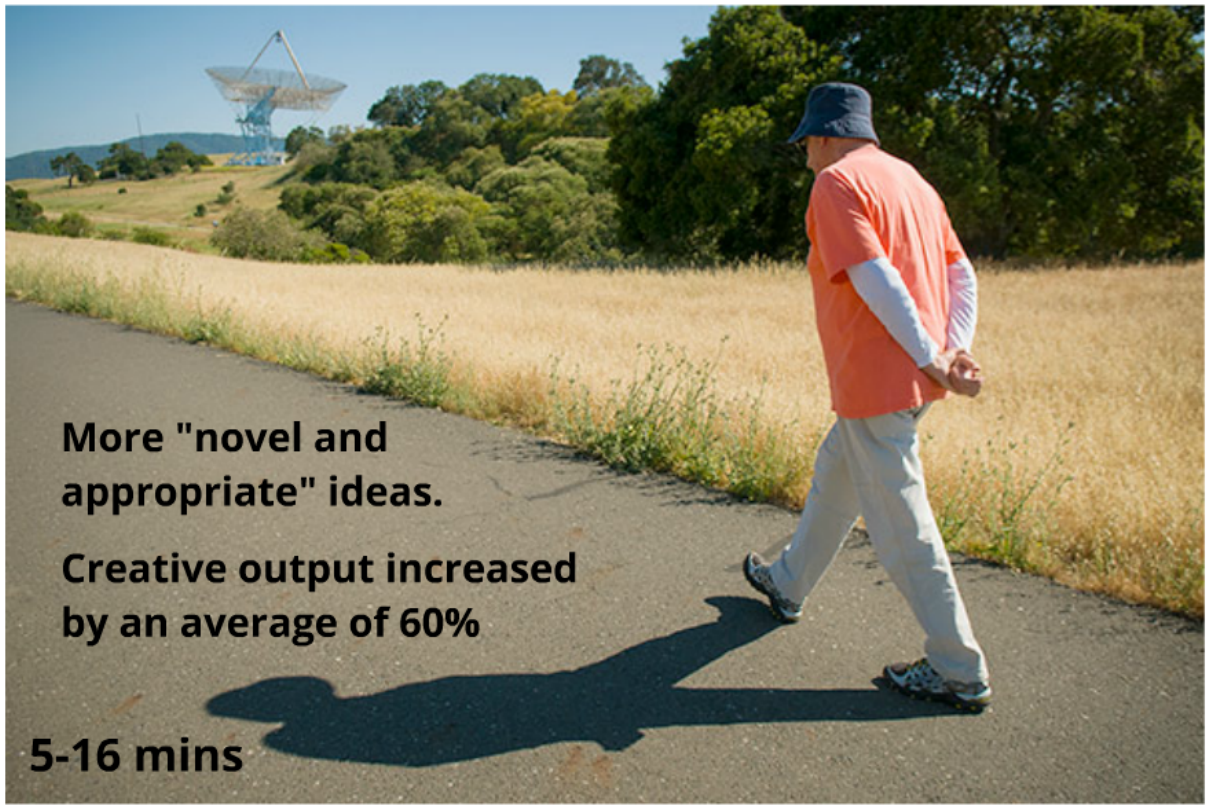


Marily Oppezzo, a Stanford doctoral graduate in educational psychology, and Daniel Schwartz, a professor at Stanford Graduate School of Education.

(2014)

Journal of Experimental Psychology: Learning, Memory and Cognition.

Creativity levels were consistently and significantly higher for those walking compared to those sitting.





They tested participants on things like coming up with alternate uses for everyday items.



Walking Outside v Walking indoors (facing wall)



No significant difference



The act of walking itself, and not the environment.

So what do you take from this?

Should we ask children to perform all thinking tasks while simultaneously walking?

Cottage

Swiss

Cheese

Cake

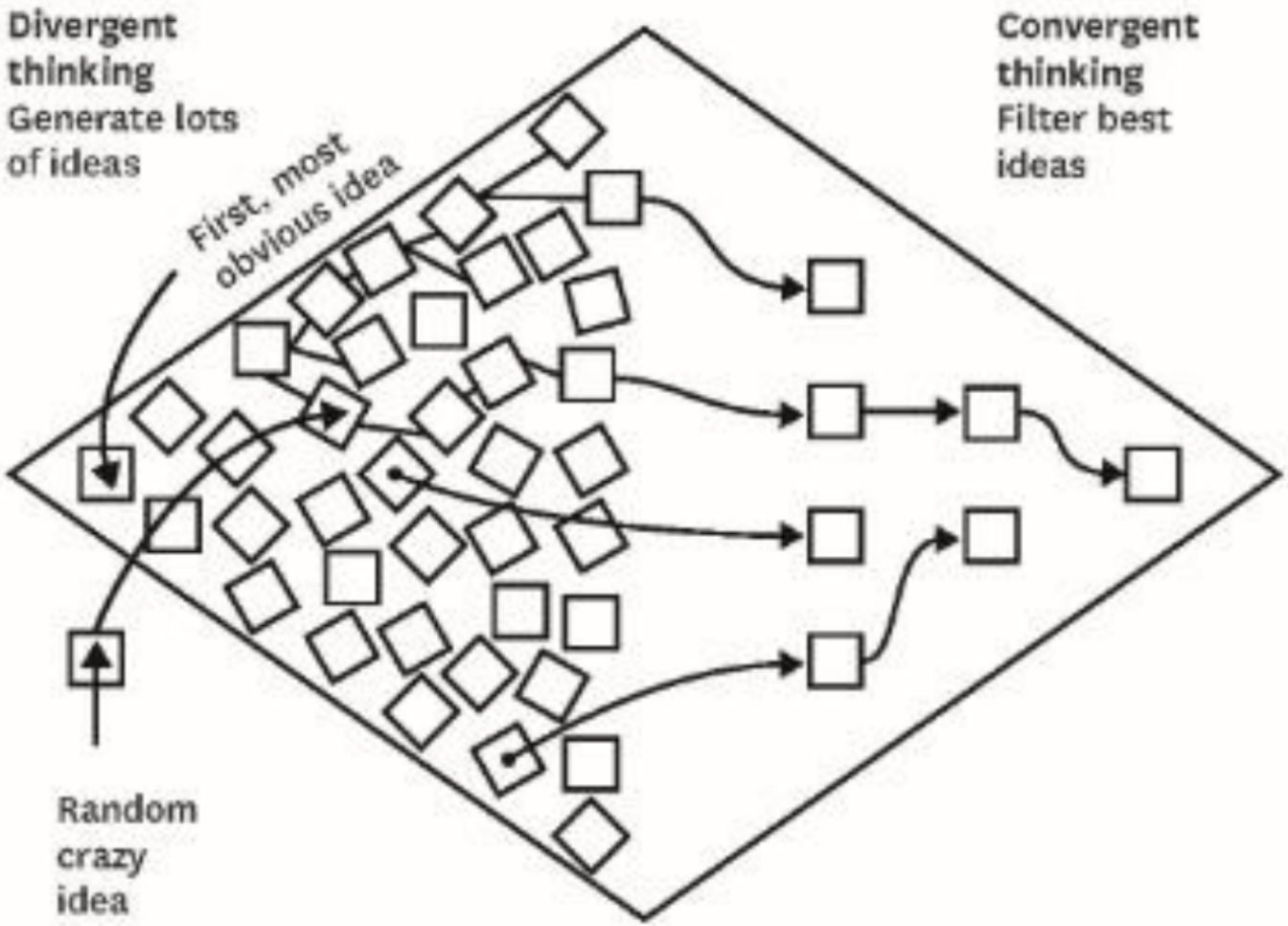
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Cottage **Swiss** **Cake**

Cheese

The research found that walking did not have a positive effect on the kind of focused thinking required for single, correct answers.



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Listen.



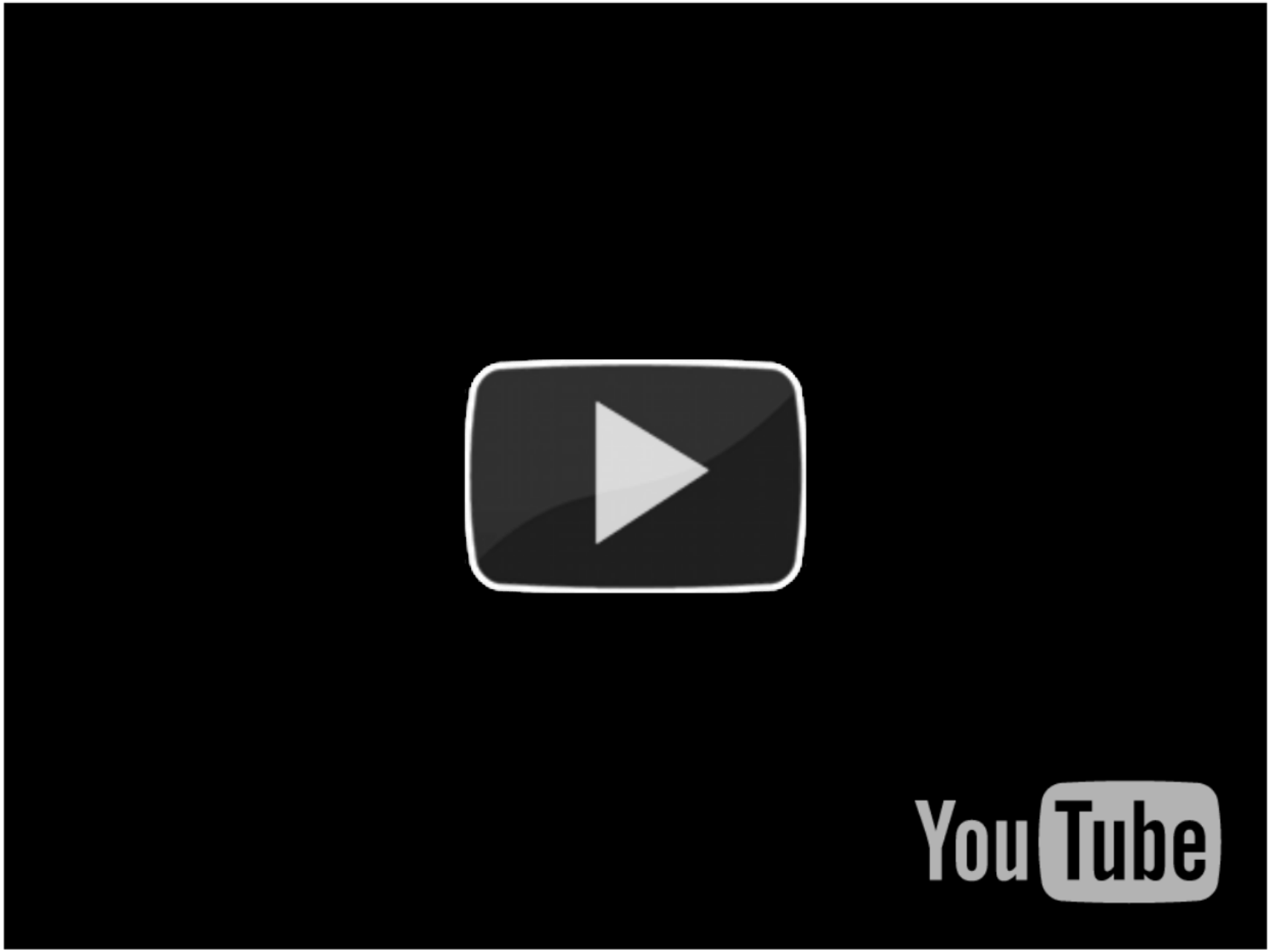
What might have they done in their video?

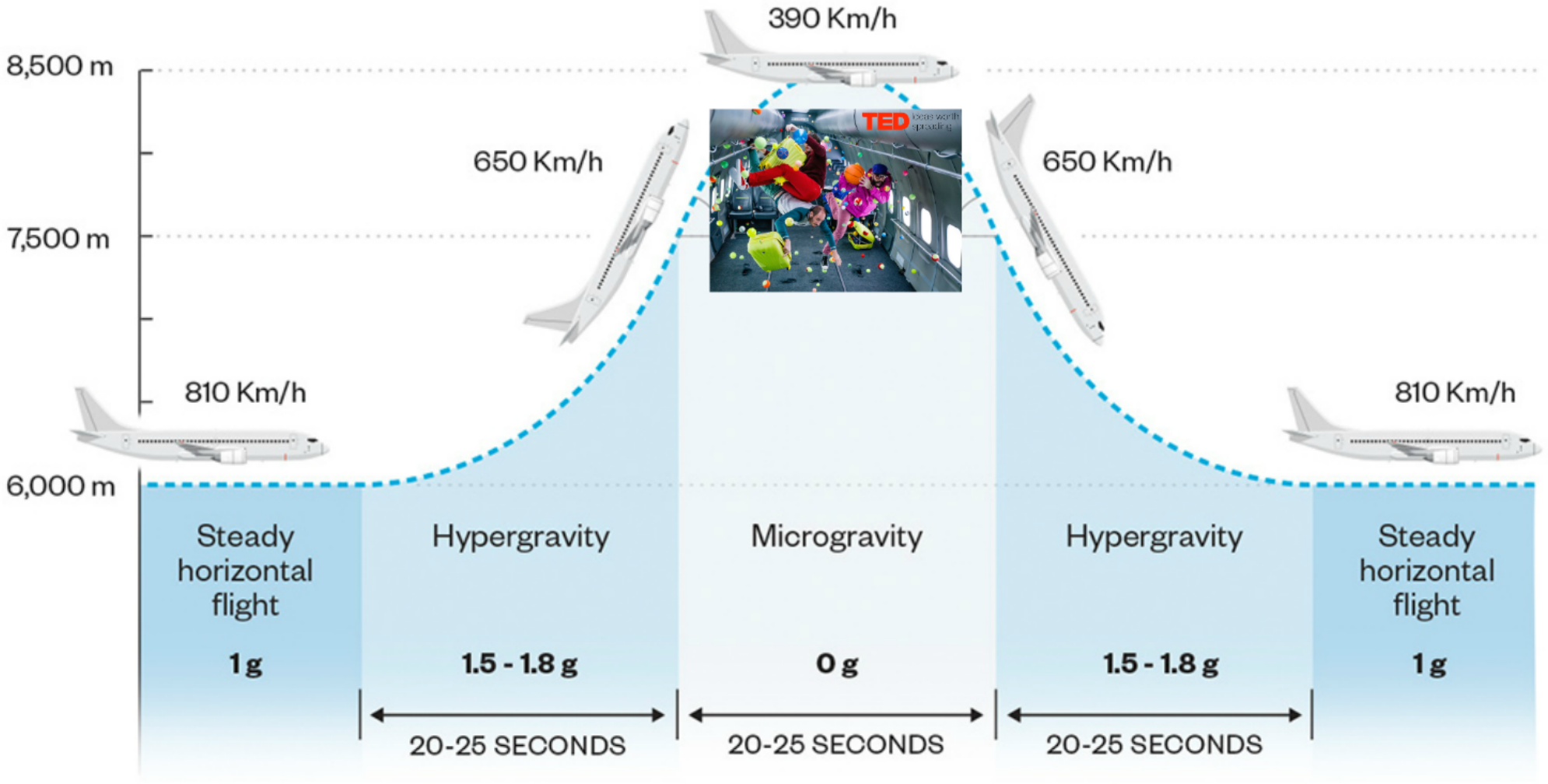


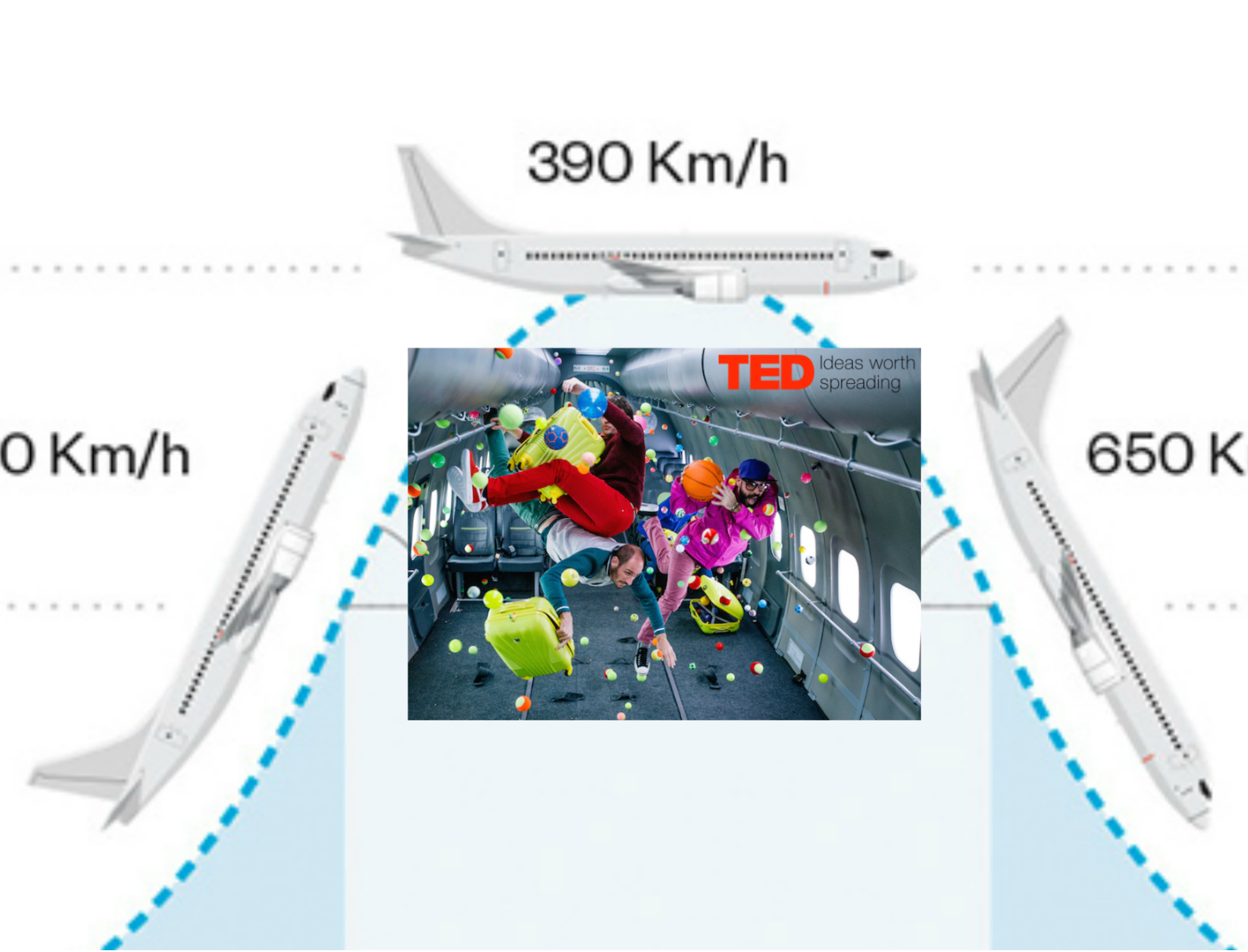




OK GO - Upside Down and Inside out

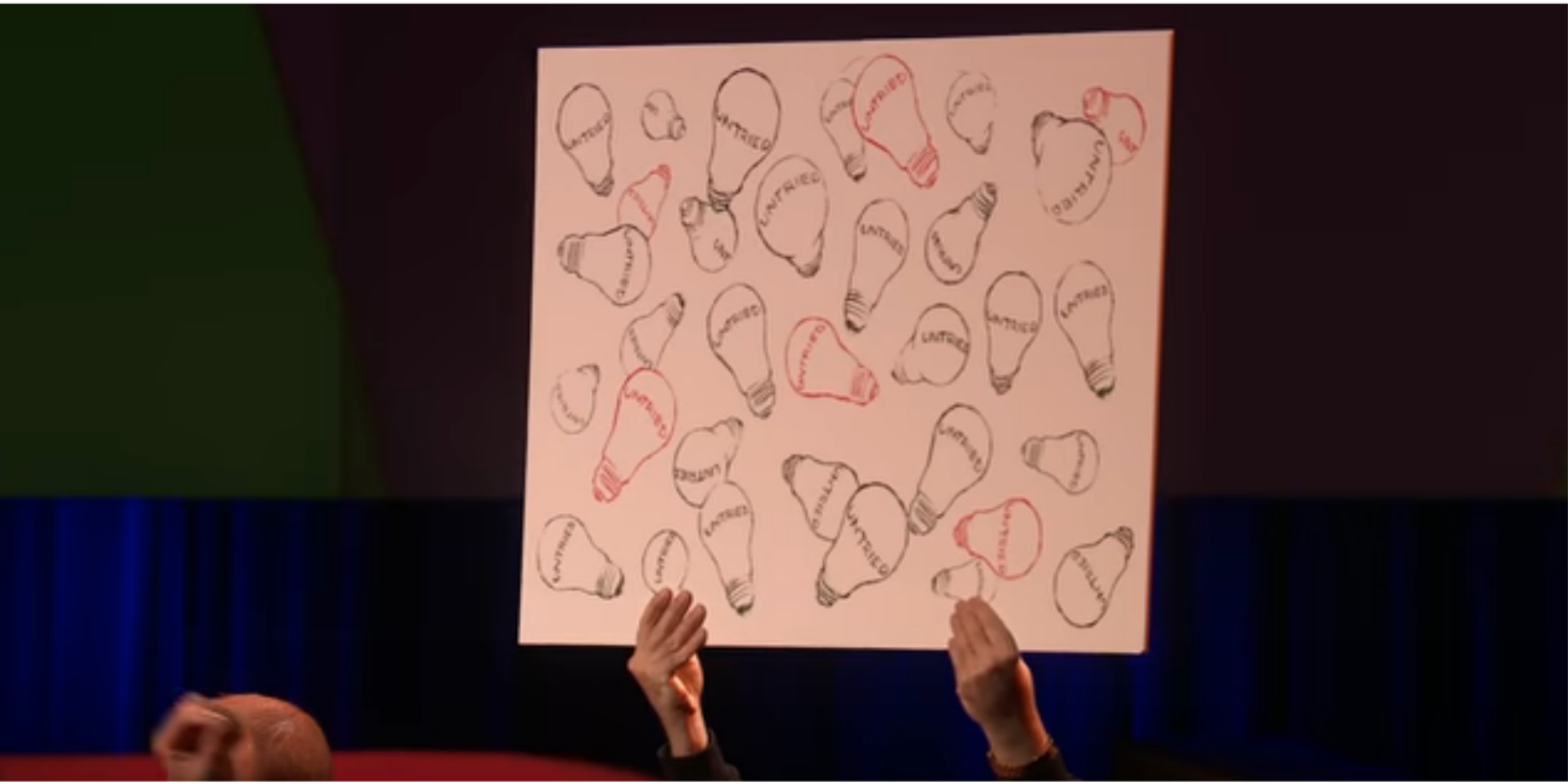


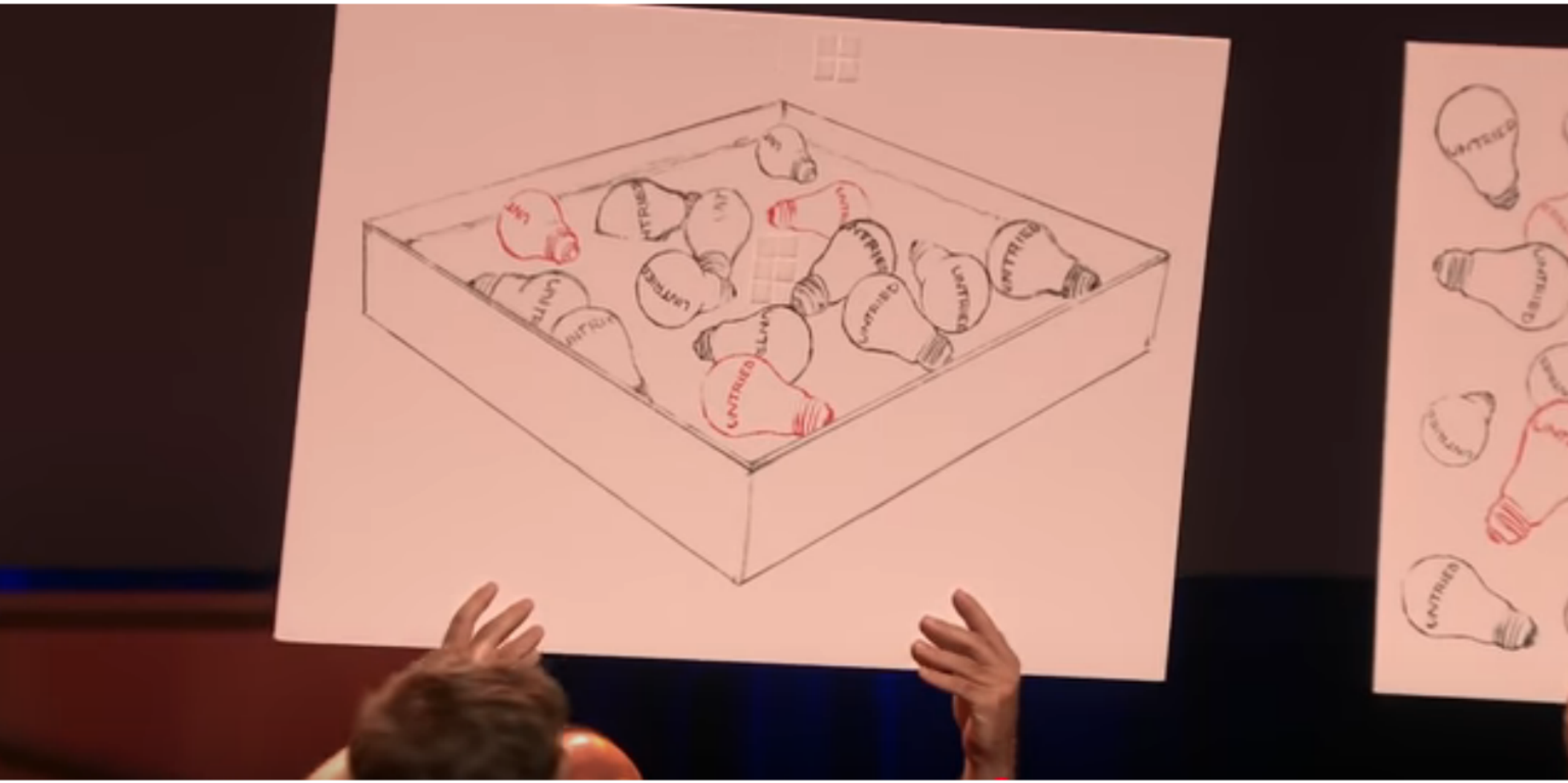

390 Km/h
8,500 m
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650 Km/h
7,500 m
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810 Km/h
6,000 m
Steady horizontal flight
1 g
Hypergravity
1.5 - 1.8 g
Microgravity
0 g
Hypergravity
1.5 - 1.8 g
Steady horizontal flight
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20-25 SECONDS
20-25 SECONDS

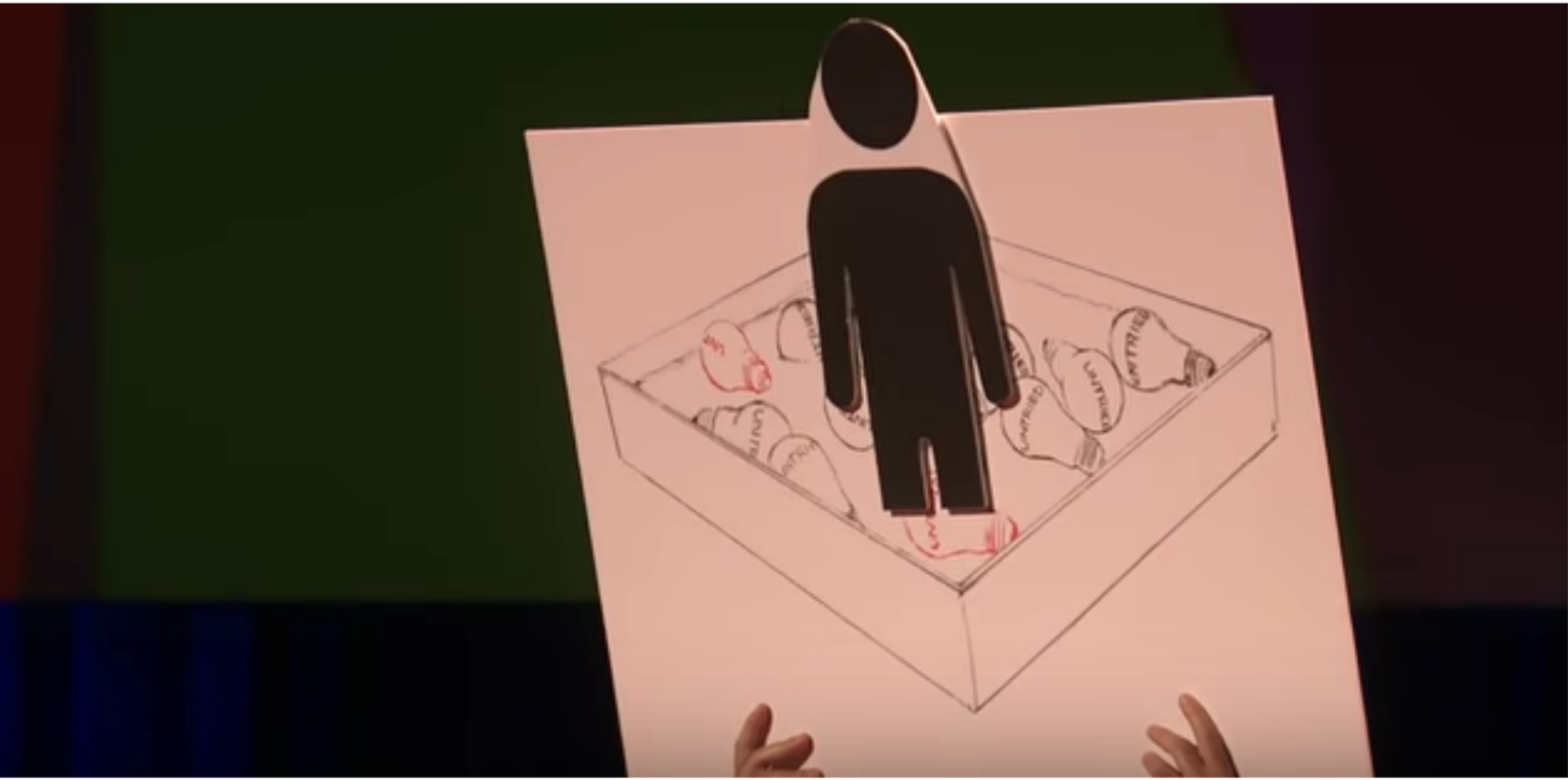

390 Km/h
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Ideas worth
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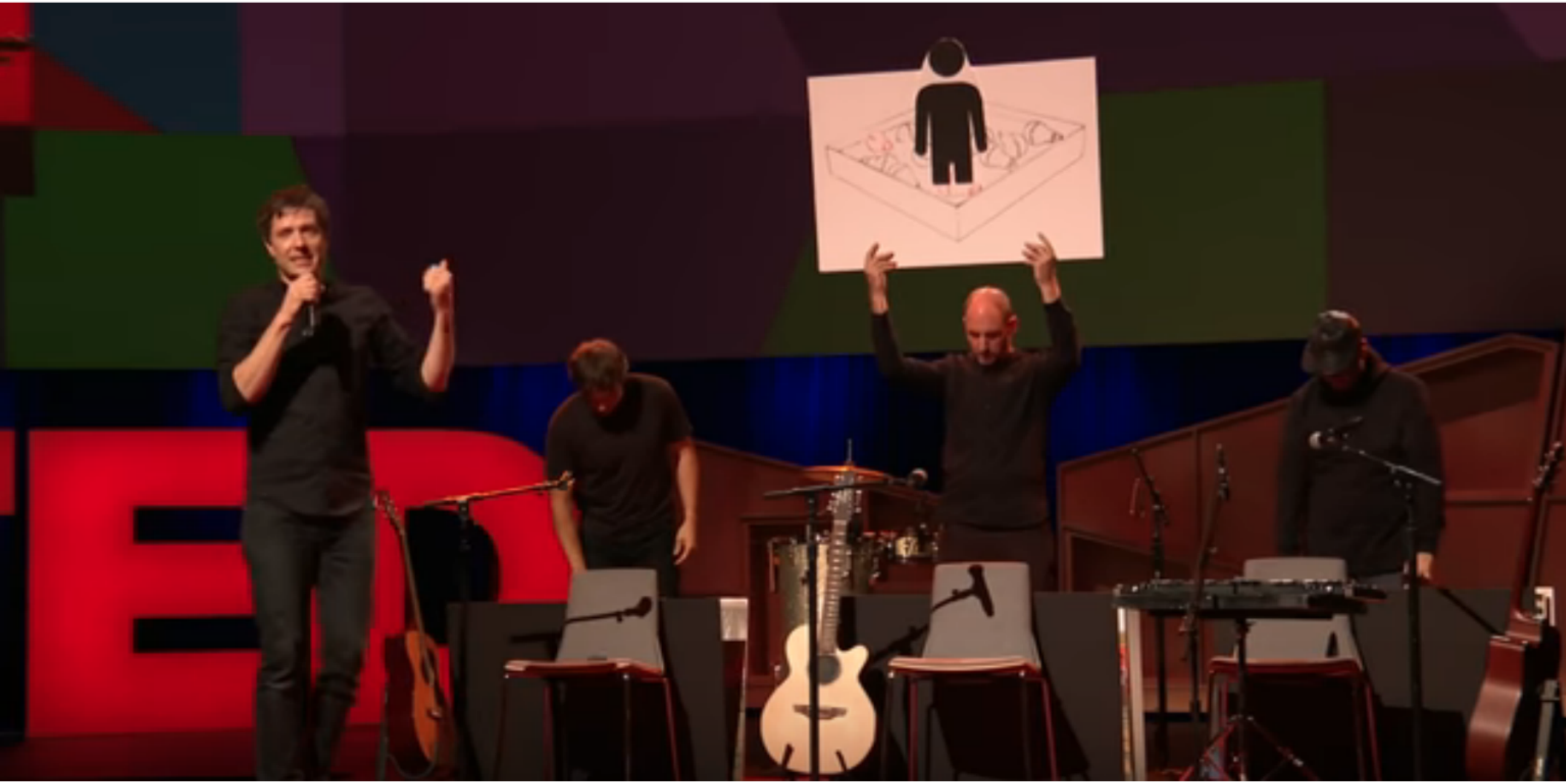

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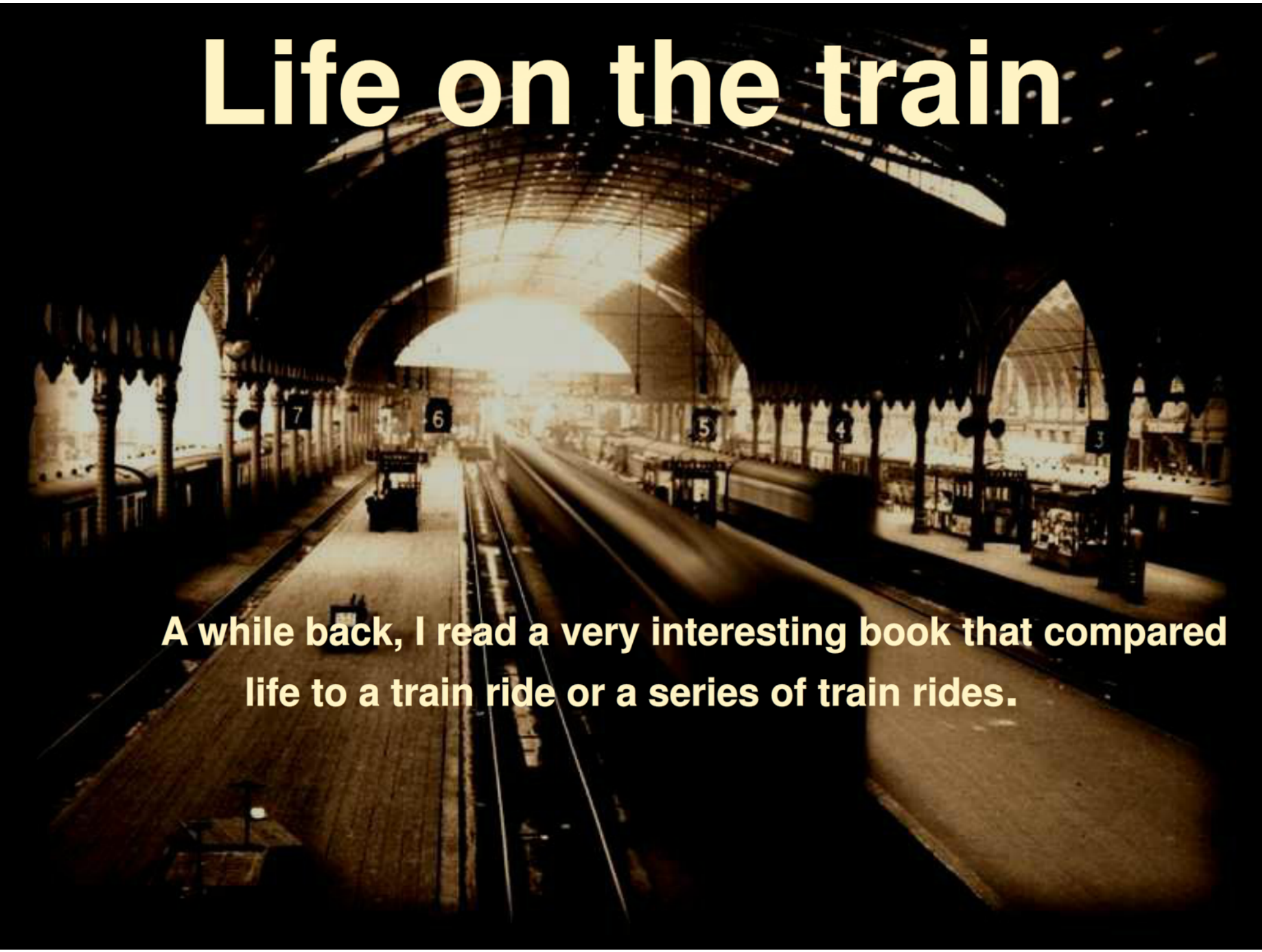

COSMONAUT TRAINING CENTER


COSMONAUT TRAINING CENTER

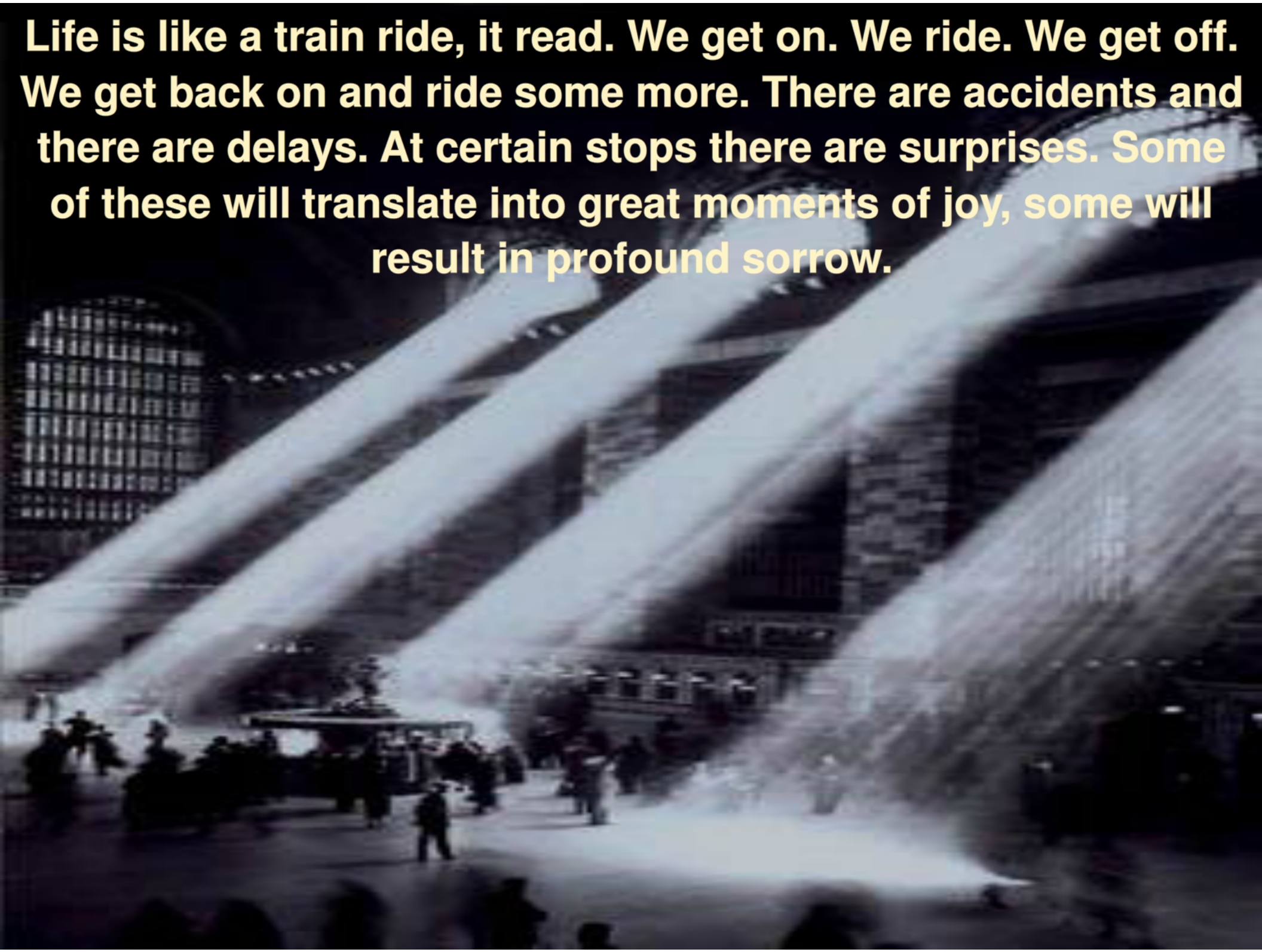
What Where are the sandboxes in school?



Life on the train



A while back, I read a very interesting book that compared life to a train ride or a series of train rides.


Life is like a train ride, it read. We get on. We ride. We get off. We get back on and ride some more. There are accidents and there are delays. At certain stops there are surprises. Some of these will translate into great moments of joy, some will result in profound sorrow.


When we are born and we first board the train, we meet people whom we think will be with us for the entire journey. Those people are our parents!

Sadly, this is far from the truth.

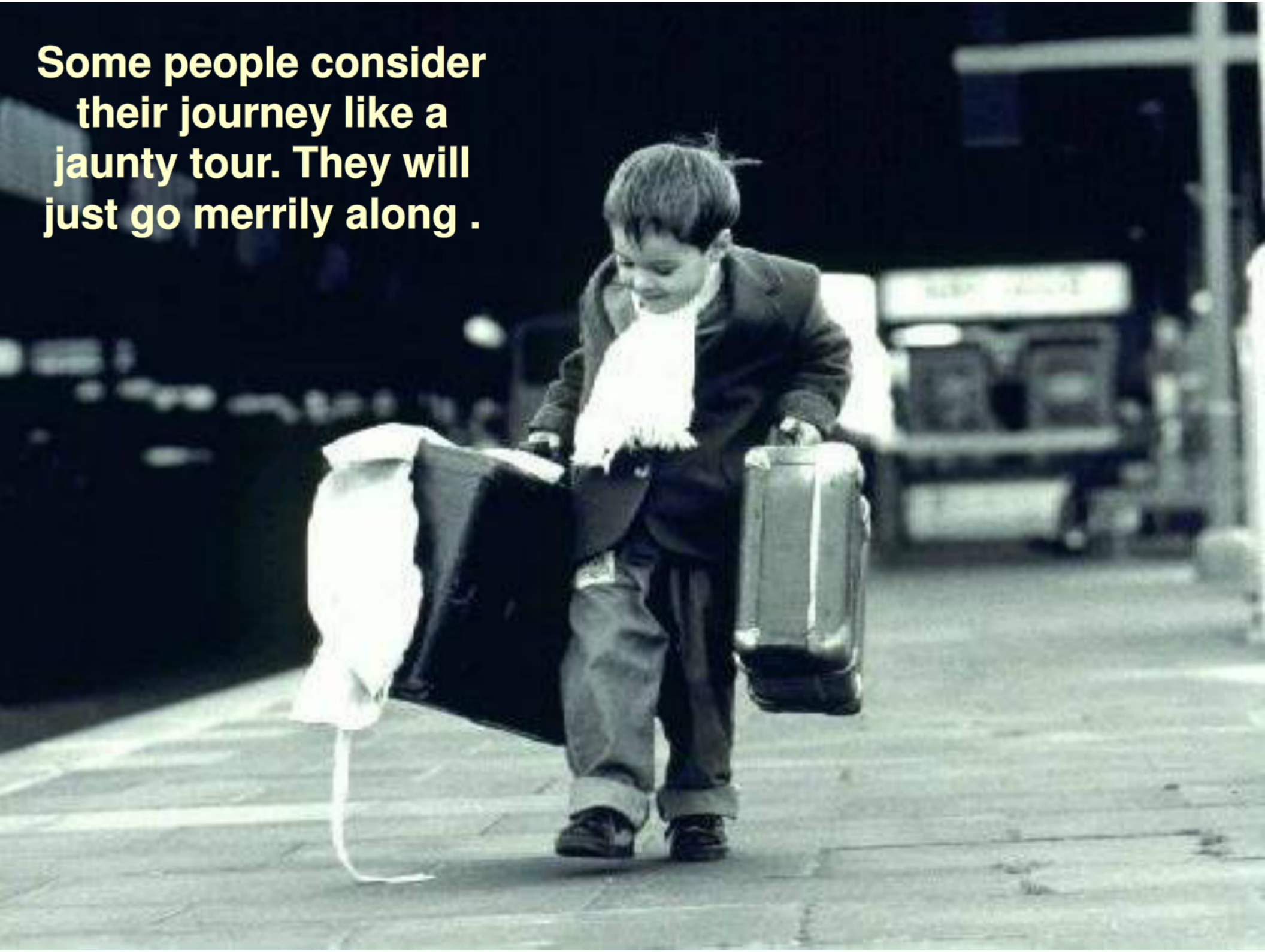
Our parents are with us for as long as we absolutely need them. They too have journeys they must complete. We live on with the memories of their love, affection, friendship, guidance and their ever presence.

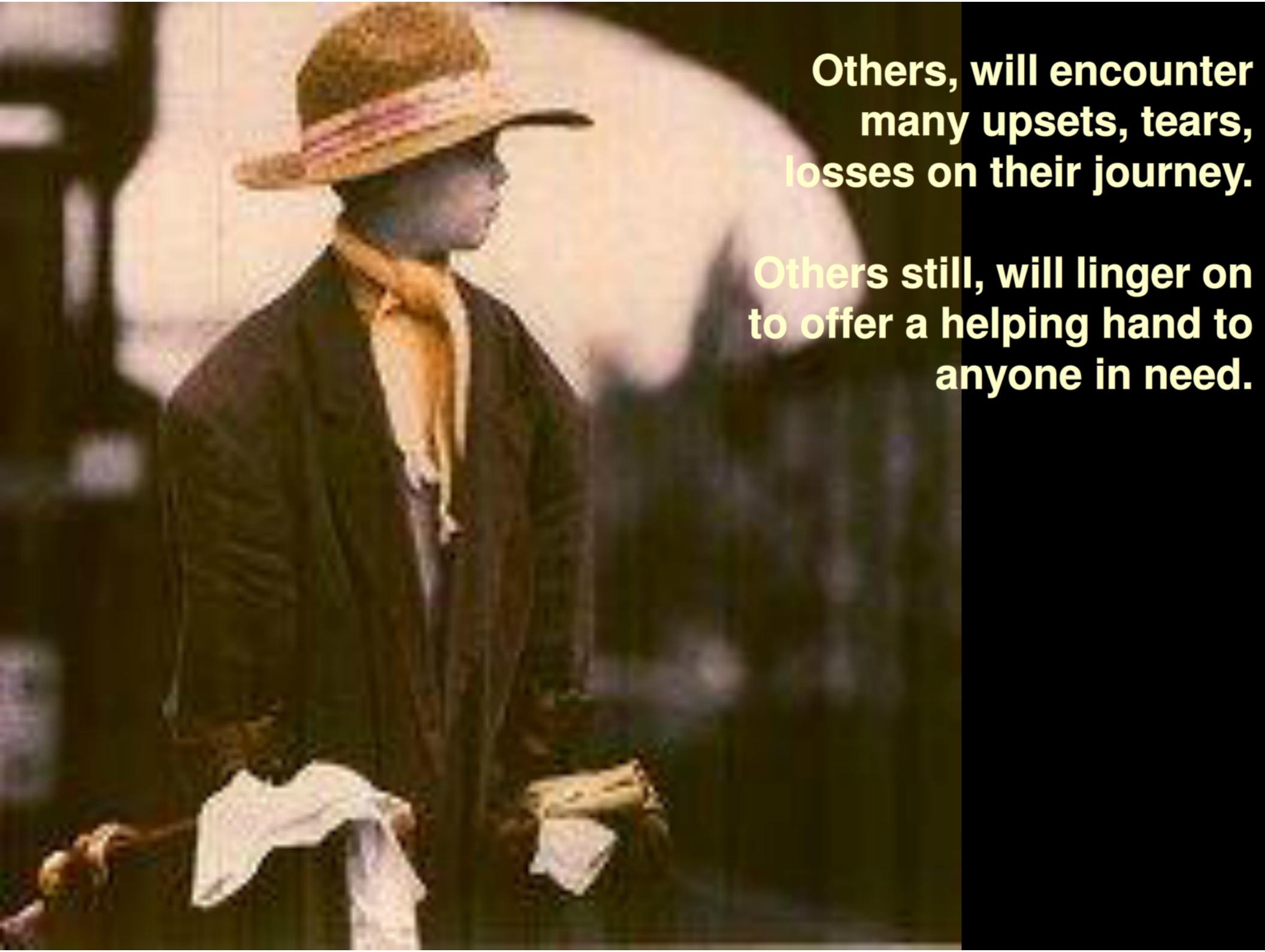


There are others who board the train and who eventually become very important to us, in turn.




These people are our brothers, sisters, friends and
acquaintances, whom we will learn to love, and cherish.


Some people consider
their journey like a
jaunty tour. They will
just go merrily along .


Others, will encounter
many upsets, tears,
losses on their journey.
Others still, will linger on
to offer a helping hand to
anyone in need.



Some people on the train will leave an everlasting impression when they get off….

Some will get on and get off the train so quickly, they will scarsely leave a sign that they ever travelled along with you or ever crossed your path…

We will sometimes be upset that some passengers whom we love, will choose to sit in another compartment and leave us to travel on our own.

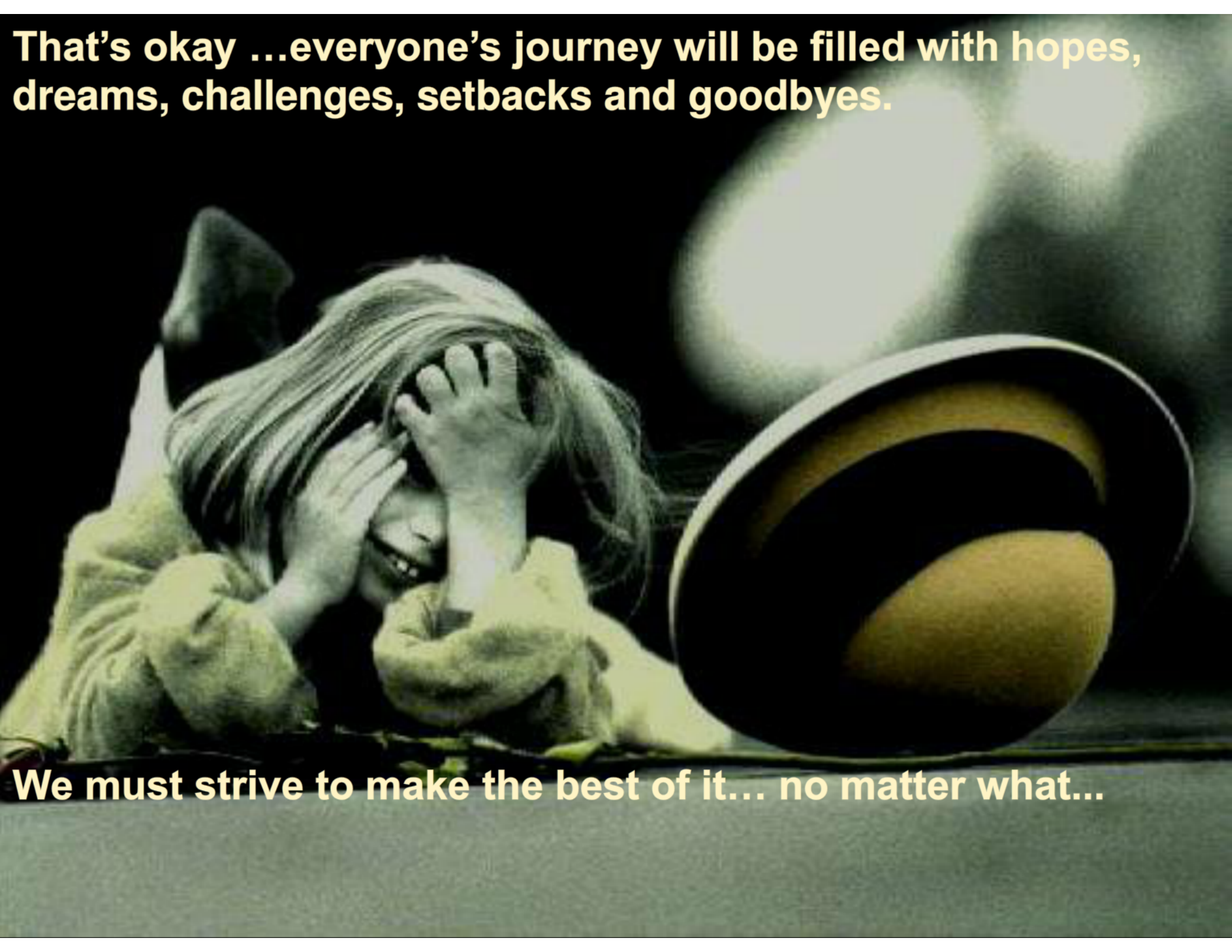
Then again, there's nothing that says we can't seek them out anyway.





Nevertheless, once sought out and found, we may not even be able to sit next to them because that seat will already be taken.

That’s okay …everyone’s journey will be filled with hopes, dreams, challenges, setbacks and goodbyes.



We must strive to make the best of it… no matter what...



We must constantly strive to understand our travel companions and look for the best in everyone.


Remember that at any moment during our journey, any one of our travel companions can have a weak moment and be in need of our help.

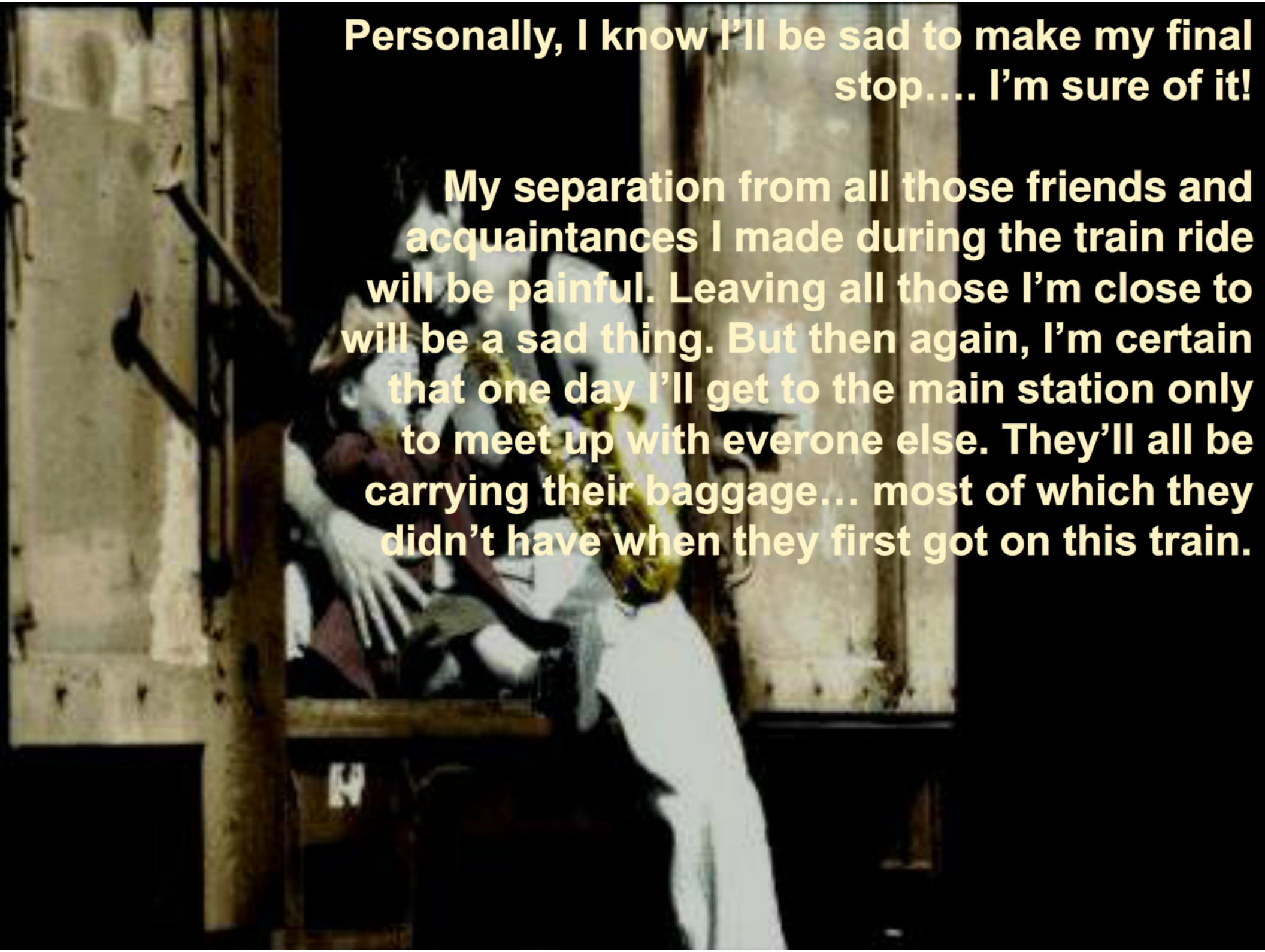

We too may vacilate or
hesitate, even trip… hopefully
we can count on someone
being there to be supportive
and understanding…



The bigger mystery of our journey is that we don't know when our last stop will come.

Neither do we know when our travel companions will make their last stop.

Not even those sitting in the seat next to us.

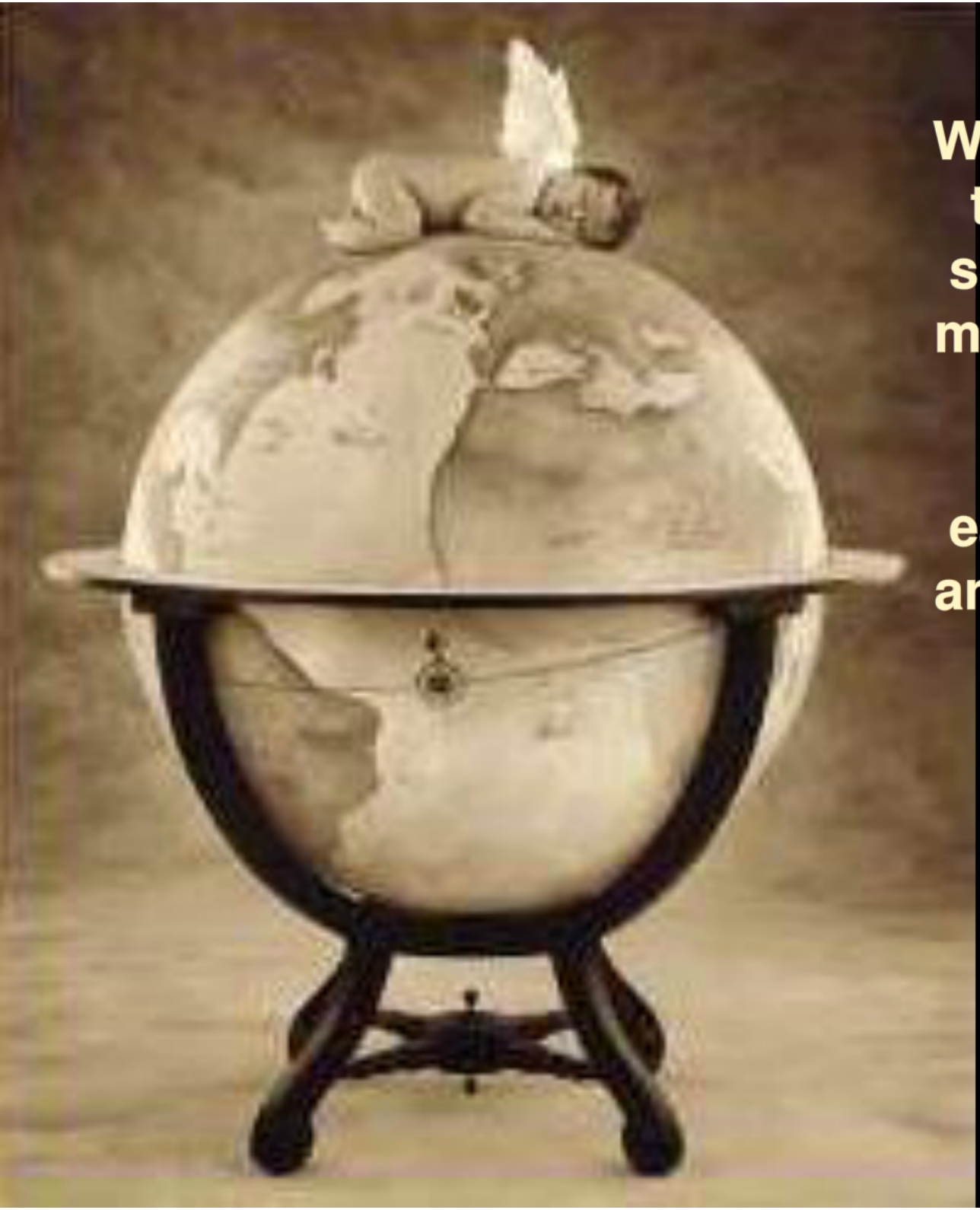


Personally, I know I'll be sad to make my final stop…. I'm sure of it!

My separation from all those friends and acquaintances I made during the train ride will be painful. Leaving all those I'm close to will be a sad thing. But then again, I'm certain that one day I'll get to the main station only to meet up with everone else. They'll all be carrying their baggage… most of which they didn't have when they first got on this train.



I'll be glad to see them again. I'll also be glad to have contributed to their baggage… and to have enriched their lives, just as much as they will have contributed to my baggage and enriched my life.



We're all on this train ride together. Above all, we should all try to strive to make the ride as pleasant and memorable as we can, right up until we each make the final stop and leave the train for the last time.


All aboard!
Safe journey!!
BON VOYAGE!