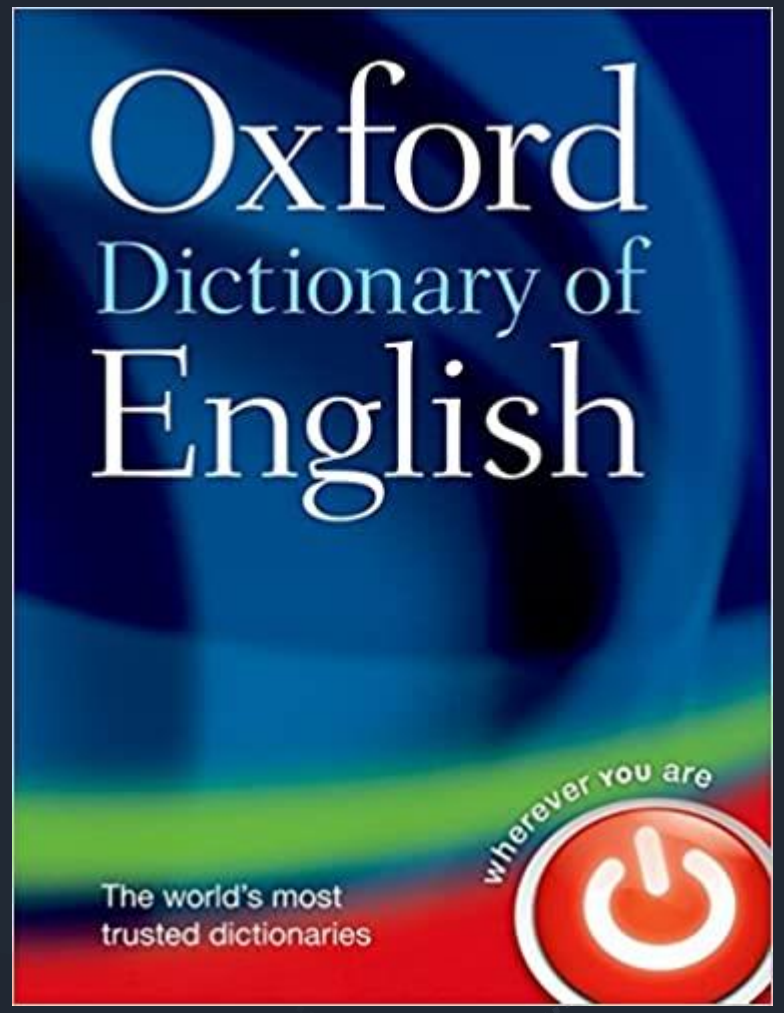

NCH Certificate in Creative Thinking

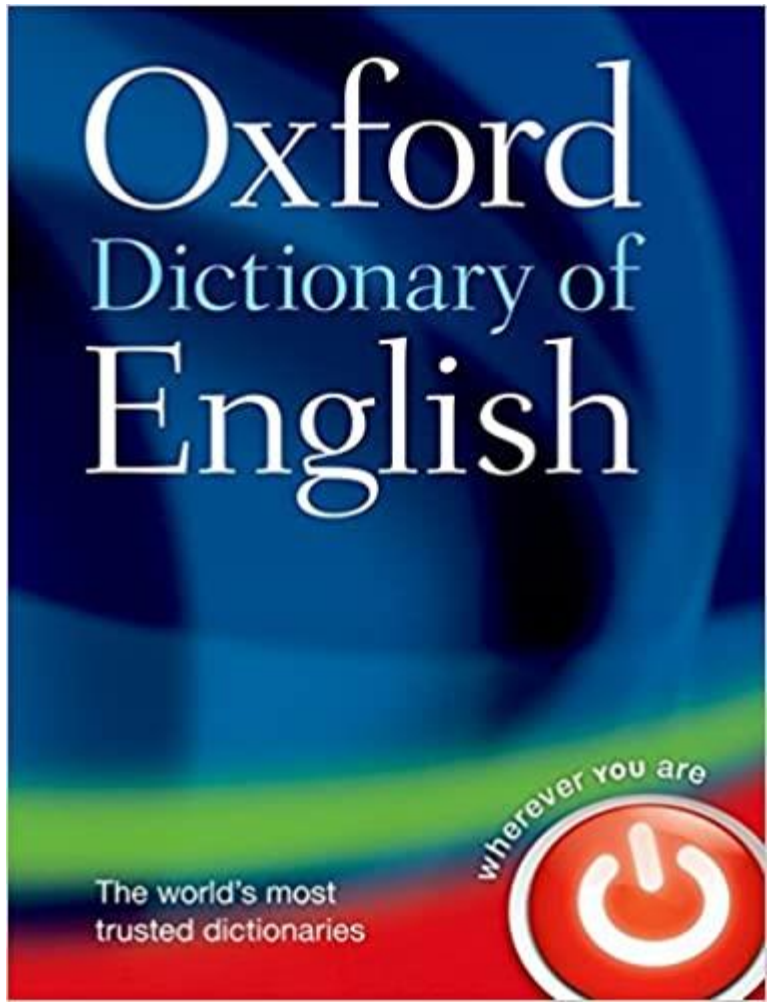
What this course is about

1. Pick and research a problem
2. Research a solution or proposal
3. Share your ideas



First Question: what is creativity?

You tell me…



Some ideas…

Creative:

‘… inventive, imaginative, showing imagination as well as routine skill…’

Which issues in today's world require creative solutions?

They need not be the big, more obvious problems. Think small, unexpected, unusual…

What do you think of these problems?

1. We throw away most pens once we have used them
2. Humans only live to an average age of around 70 years
3. Surgeons have to have steady hands to perform operations
4. The Yamuna river is full of toxic waste
5. People are still not aware enough of the environment
6. Lots of fonts are difficult for people with dyslexia to read
7. Humans cannot yet live on Mars
8. Education systems are imperfect

- Next:

- Name some of the world’s greatest creative thinkers…

Thomas Edison

Isaac Newton

Walt Disney

Albert Einstein

Steve Jobs

Marie Curie

Leonardo Di Vinci

Young Creative thinker 1: Jack Andraka

At the age of 15, he invented a new type of sensor to spot the presence of cancer cells, which proved to be less expensive, much faster (x168), and more accurate (25-50%) than all other tests. He was rejected by almost 200 labs until he was finally endorsed by Dr. Anirban Maitra at John Hopkins.

*Taken from https://brightside.me/wonder-people/10-kids-that-changed-the-world-392510/

Young Creative Thinker 2: Malala Yousafzai

The youngest individual ever to receive the Nobel Prize was born in Pakistan. She lived in a small town ruled by the Taliban, which banned girls from receiving any education or attending school. At the age of 11, she was writing a blog for a local BBC station, voicing her desire for girls to continue studying. When she turned 15, Malala was shot in the head by a Taliban gunman while she was riding a bus to school. She survived the attack and was sent to a hospital in Birmingham, UK, where she now lives and runs a number of education projects.

*Taken from https://brightside.me/wonder-people/10-kids-that-changed-the-world-392510/

Example Create Project Outlines

I am using architecture to design and build an Amur Leopard sanctuary on the grounds of their current wild habitat, removing the need to take animals out of the wildlife and across borders

Example Create Project Outlines

We are using a drone system to solve the problem of travelling far for water and to provide the vital technology for struggling low income and developing countries.

(Yes, you can work in groups of up to three.)

Example Create Project Outlines

I am using an existing Lagoon, situated in Lagos, to solve the problem of extreme population growth. It will consist of an underwater village which generates electrical energy to provide sustainable homes for low income countries.

Example Create Project Outlines

We are using a range of methods to propose a solution to the problem of the deterioration in mental and physical health for over 65s.

Example Create Project Outlines

I am using the aspects of the style Pablo Picasso's 'Guernica’ to help create artwork that may help influence people's views of social and environmental issues.

What might your project be…?

Brainstorm
Discuss
Research
Feedback to me

Before you go…

How it will be marked?

Grades 1 – 3	There is some evidence of project management and a limited degree of commitment is shown. Creative ideas are discernible and a question is chosen. Most of the research material is explained rather than analysed in relation to the creative ideas. The source range is modest (6 or fewer) and the sources tend to be easy to access website with only limited academic content. There is some presentation of creative ideas and a conclusion is given.

How it will be marked?

Grades 4 – 6	Project management is reasonable, with some degree of commitment shown. There are reasonably strong creative ideas and the choice of topic demonstrates some thoughtfulness. There is some analysis of research in relation to creative ideas. There is a reasonable range of sources (at least 7) and some of these have some reasonable high-level content. The project includes some background and presentation of creative ideas, including ideas that overcome obstacles.

How it will be marked?

Grade 7 – 9	An impressively managed project, showing commitment and dedication throughout, with a clearly focused aim and careful thought in relation to the chosen topic. Research is analysed carefully (not simply summarized) in connection with the chosen topic. Sources are carefully and fully referenced and the bibliography is complete. The student shows care in their choice of sources and uses a good range (at least 10); not simply easy to access websites but sources with good academic content). They explain the background to the topic and develop innovative creative ideas.

What can you remember from the first session?

What is creative thinking?
Example problems
Example Create Titles

Recap of Creative Thinking Course

1. Pick and research a problem
2. Research a solution or proposal
3. Present your ideas

Choosing a problem…

A or B - which is more impressive?

A - ‘I will be looking into the problem of global warming.’

B - ‘I will be looking into the problem of rising sea levels in Kiribati.’

Why is this one more impressive?

‘I will be looking into the problem of rising sea levels in Kiribati.’

_____

Tip:

Specificity implies deeper, more detailed knowledge.

Easy one:

Why is B more impressive than A?

A - ‘I’m fairly interested in the issue of plastic wastage.’

B - ‘I’ve always wanted to design something that was completely my own, so I am proposing to design a plastic- and metal-free re-fillable pen.’

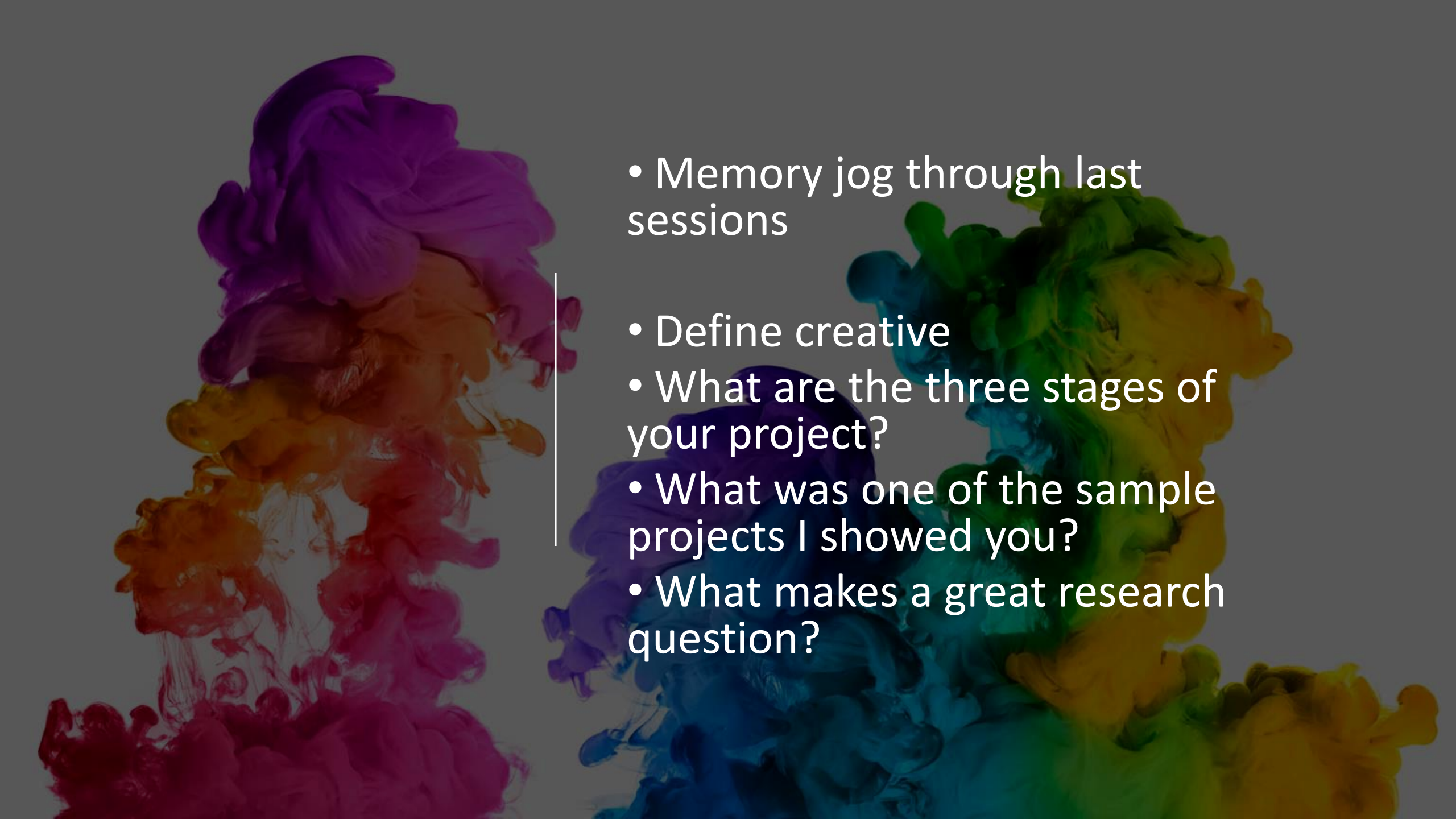
Tip 2:

Caring about your project topic is crucial.

This is your chance to have completely free choice. Make it meaningful to *you*.

- Today: Working on your own or in a group with a shared interest, start to form your project problems, focusing on

- Specificity
- Meaningfulness to you



- Memory jog through last sessions

- Define creative
- What are the three stages of your project?
- What was one of the sample projects I showed you?
- What makes a great research question?

If your project were the following, what would you need to find out?

‘I will be looking into the problem of rising sea levels in Kiribati.’

- Some basic info about Kiribati (Where? How big?)
- Information about why sea levels are affecting Kiribati (Position? Size? Sea currents?)
- What else?

Before you get started…
Create a table like this…

Bibliographic details of source	Information of source	Evaluation of source (WWWWH)	How might this be useful?

*WWWH = Who wrote it, why did they write it, when did they write it, how professionally is the source presented?

Bibliographic details of source	Information from source	Evaluation of source (WWWWH)	How might this be useful?
www.nanotechnology.com/Alan-Smith-Why-Nano-Is-Key	'nanotechnology has been used extensively in the development of water-resistance in camera displays'.	Smith is a professor at Yale. The article is recent and published by a respected journal.	This is useful background info to set up my knowledge of my problem.

- Tip: use referencing software such as mybib.com to help turn article titles or URLs into full footnotes with author, publisher, date and so on.

- Make your own list of things you need to find out about your project, and research them!
  - 5 = Good
  - 10 = Very good
  - 15 = Excellent

Before you go… Tell me what you found.

- Memory jog through last sessions

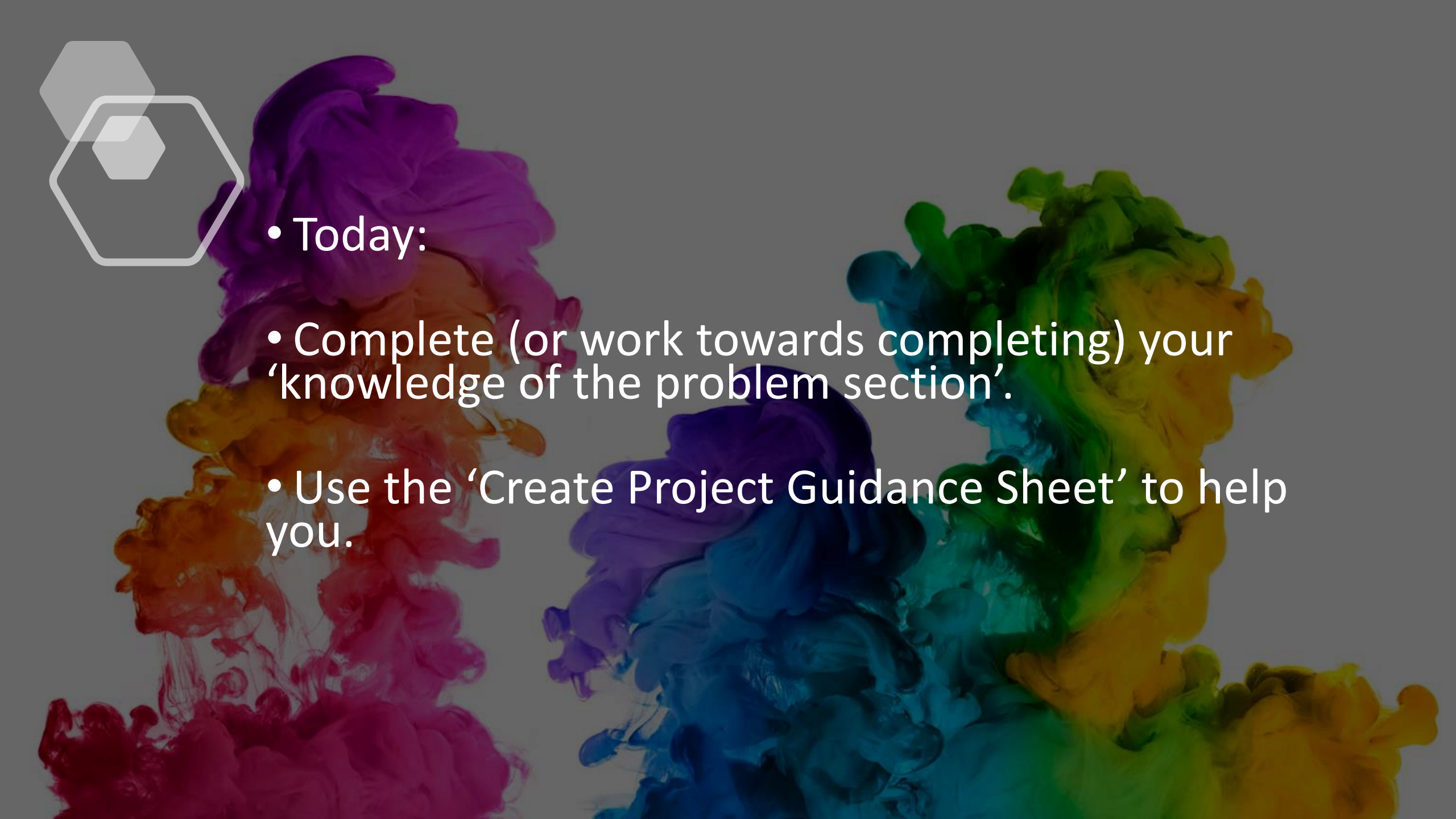
- Define creative
- What are the three stages of your project?
- What was one of the sample projects I showed you?
- What makes a great research question?
- What goes in your bibliographic table?

Today’s new skill: referencing.

Question: why is there a little number 1 here?

Smith claims that ‘nanotechnology is amongst the fastest-growing scientific disciplines in the world.’[1]

You will need to put in a footnote (normally click ‘References---Footnote’) whenever you use information that you have learnt from your reading. At the bottom of the page you put the bibliographic information from the source.

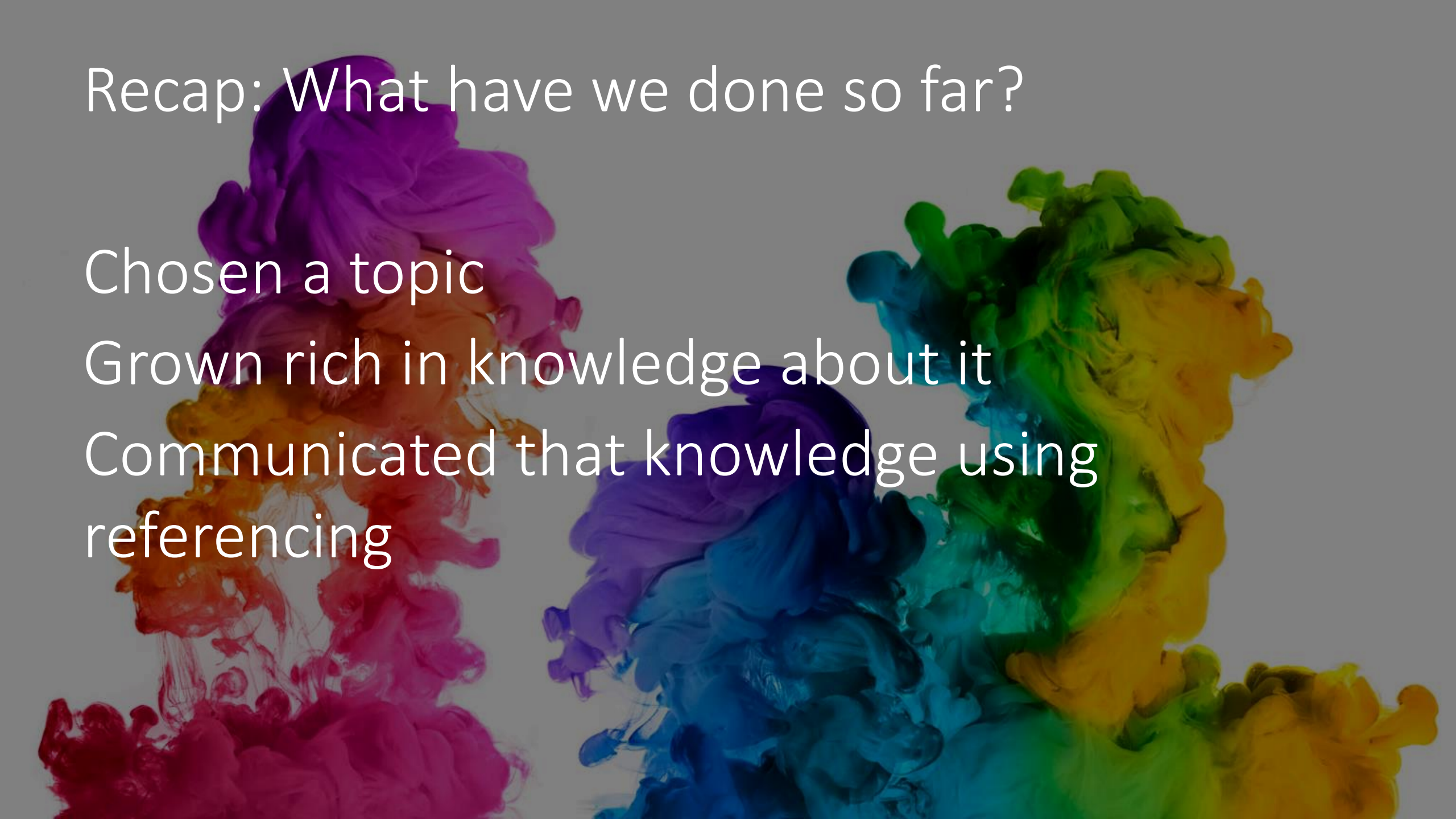


- Today:

- Complete (or work towards completing) your ‘knowledge of the problem section’.

- Use the ‘Create Project Guidance Sheet’ to help you.

Recap: What have we done so far?



Chosen a topic

Grown rich in knowledge about it

Communicated that knowledge using referencing

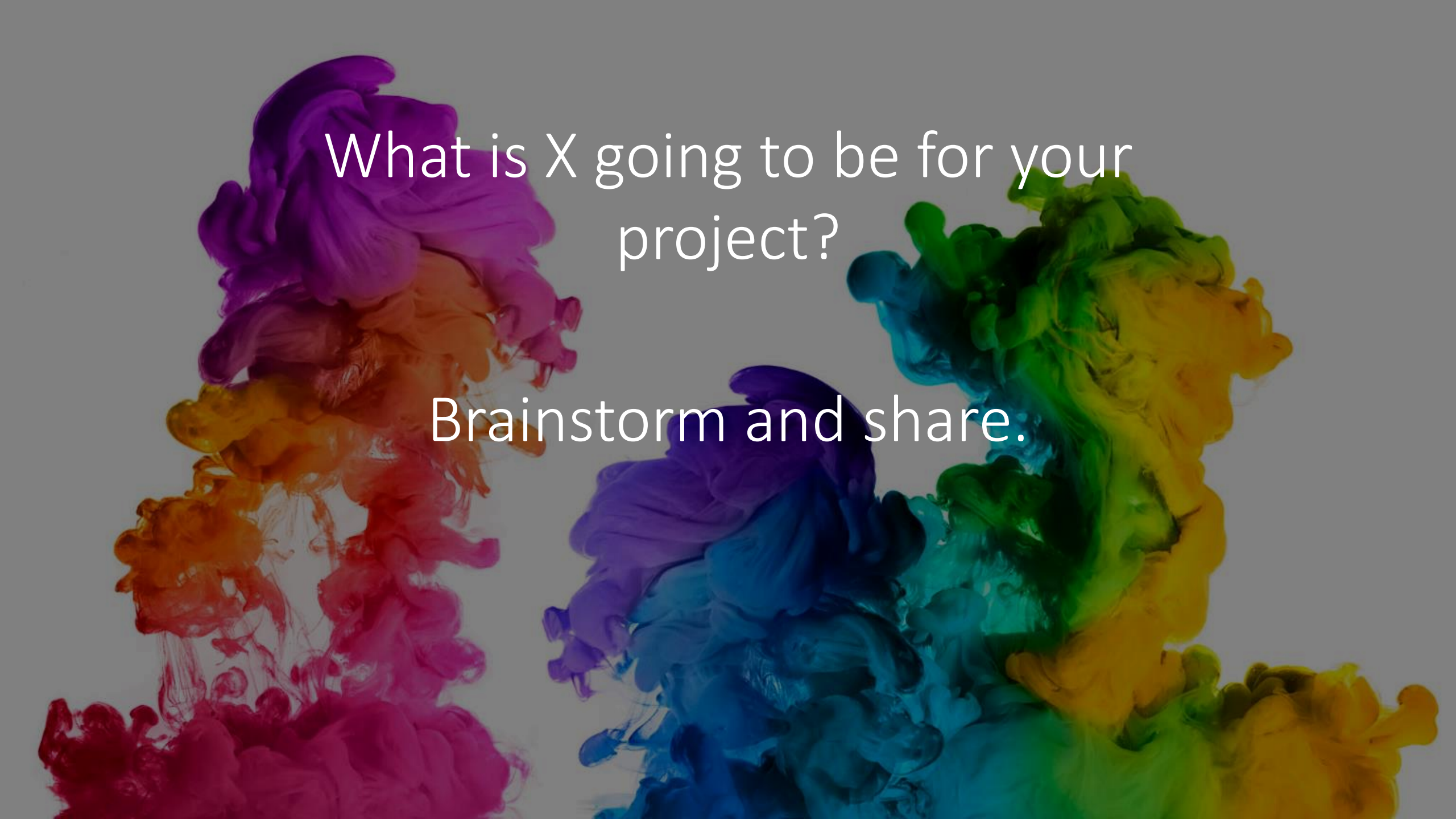
Next Step: How do I think creatively in response to the problem I have identified?

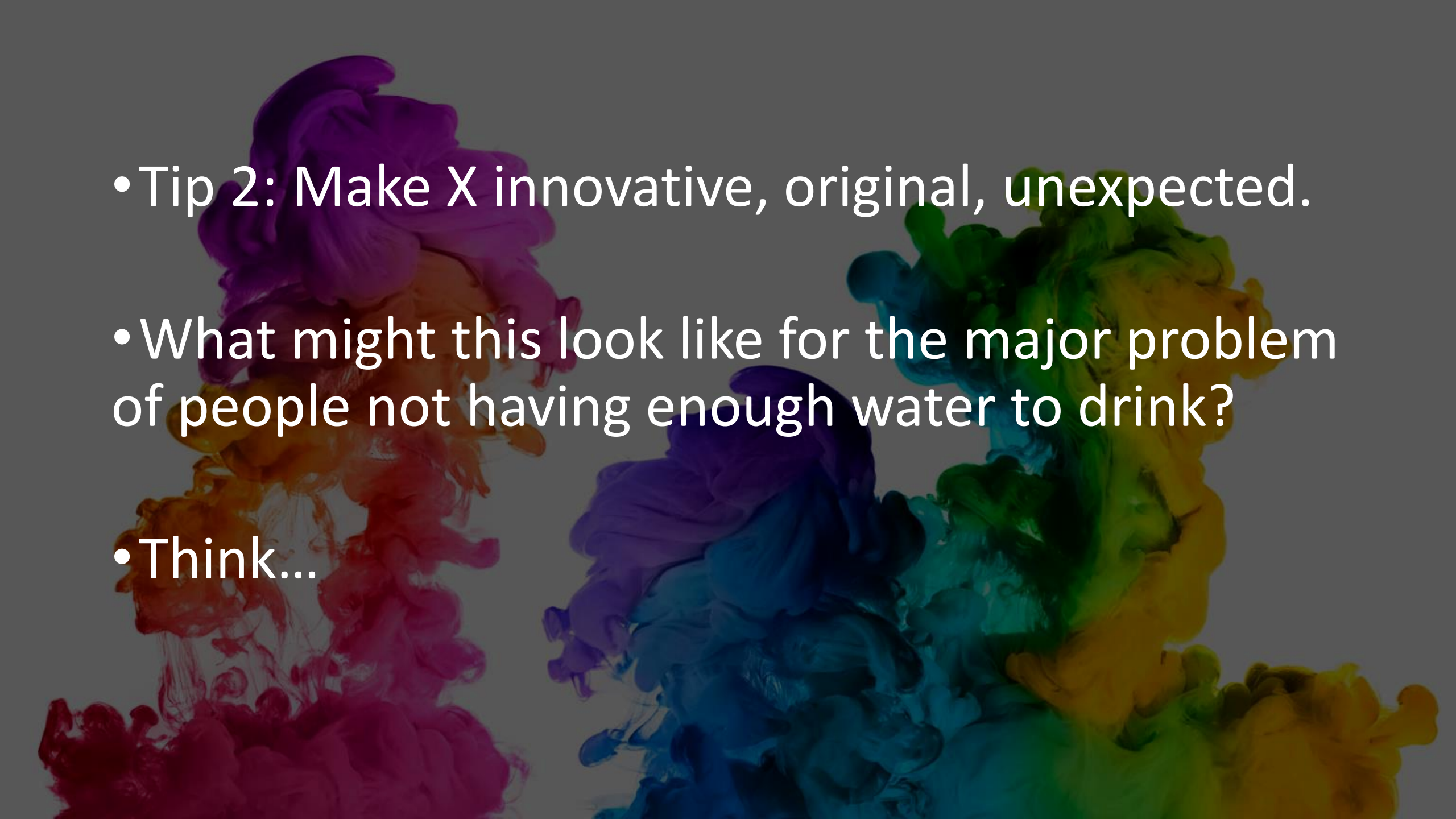
Skill for the week:
Application of concepts.

Write down the following sentence: *I will be using X to solve the problem of Y / to develop a proposal about Y.*

Now re-write it and fill in Y, where Y is your chosen topic area.

I will be using X to solve the problem of Y / to develop a proposal about Y.


What is X going to be for your project?
Brainstorm and share.



- Tip 2: Make X innovative, original, unexpected.
- What might this look like for the major problem of people not having enough water to drink?
- Think…

Remember this?

We are using a drone system to solve the problem of travelling far for water and to provide the vital technology for struggling low income and developing countries.

Brainstorm X again. Go further.

Question: Does your X require you to find out new things by doing research?

Advanced Brainstorming Technique:

Work on your own on your brainstorm.

Then pass your brainstorm on. Everyone adds ideas in a new colour to the existing ideas.

Then pass along again.

And… Research.

What do you need to find out about X in order really to apply it to Y?

Don’t forget your research log….

Bibliographic details of source	Information of source	Evaluation of source (WWWWH)	How might this be useful?

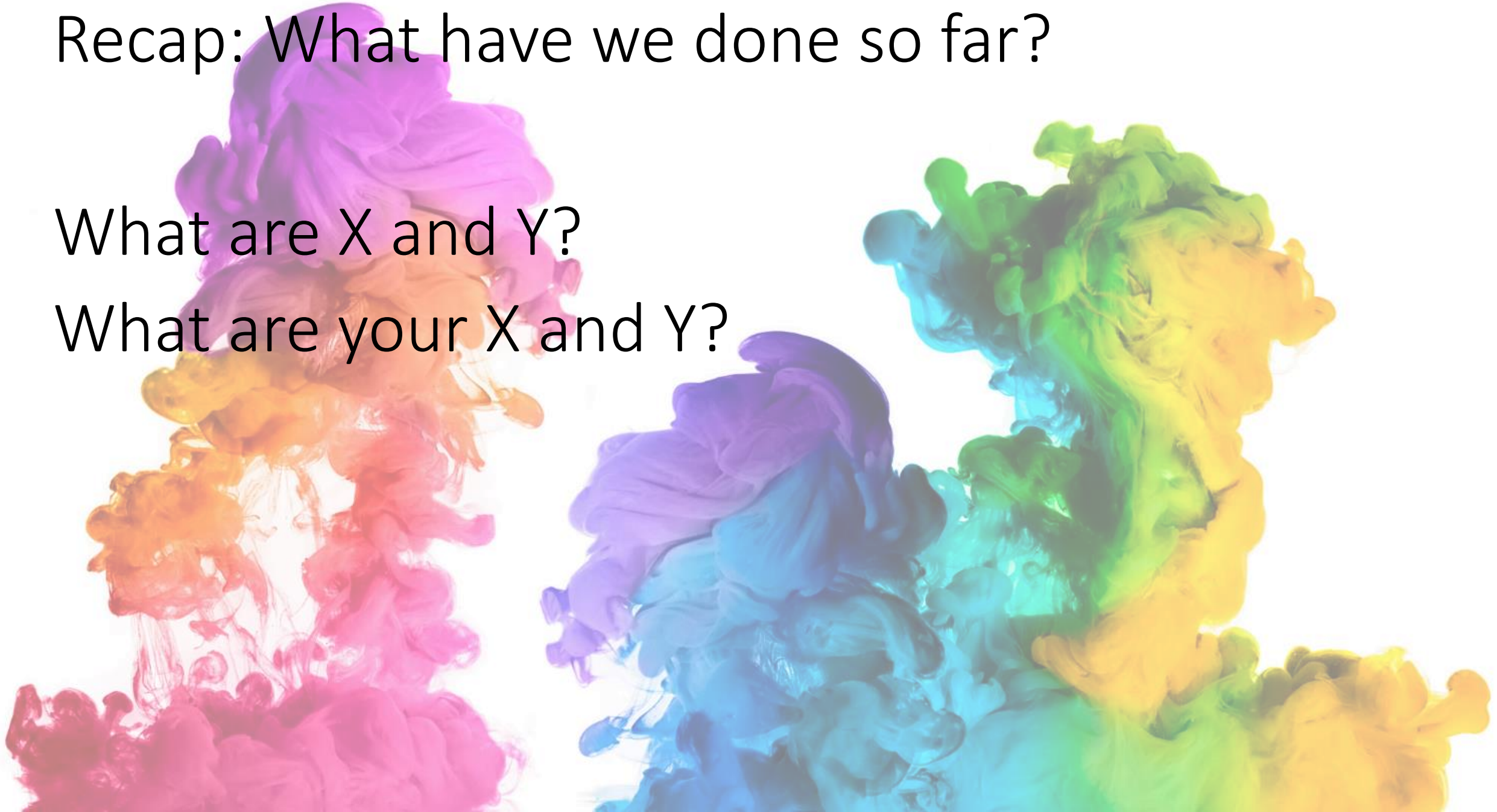
Recap:

- What are X and Y?
- What are *your* X and Y?

Recap: What have we done so far?

What are X and Y?

What are your X and Y?



Tip for the day: Problematize your problem.

Question: What problems are there with desks?

Brainstorm

- Some ideas.
    - They hurt people’s backs because they aren’t at the right height.
    - They have sharp corners.
    - They don’t enable me to move my legs from side to side.
    - They are heavy

- Problem: Desks hurt people’s backs because they aren’t at the right height.
- Solution: electronic adjustability.

So… Problematize your problem.

Think / Discuss / List

And… Research.

What do you need to find out about X in order really to apply it to Y?

Don’t forget your research log….

Bibliographic details of source	Information of source	Evaluation of source (WWWWH)	How might this be useful?

Recap:

- What are X and Y?
- What are *your* X and Y?
- What is problematizing the problem?

Tips for the day:

Systematic Inventive Thinking* is a way of approaching the generation of ideas.

We will use the acronym SCAMPER to help you remember

*See “Finding Your Innovation Sweet Spot,” Harvard Business Review, August 2014, https://hbr.org/2003/03/finding-your-innovation-sweet-spot.

Substitute
Combine
Adapt
Magnify
Put to other use
Eliminate
Rearrange

SCAMPER

Substitute

Take away something that is vital / crucial and see what you could replace it with.

Example.

Taking away the buttons from mobile phones.
Replacement: touch screens.

How could you do the same with, say, a table?
What could replace the *legs* of a table with?

Substitution Idea:

Take away the legs and, instead, suspend the table from the ceiling. If the table were suspended with secure metal ‘rope’, it wouldn’t sway.

What do you think of this idea?

S**C**AMPER

Combine

Simply add something to an existing object or idea.

Example.

What could you add to an oven to make it better?

Ideas…

Speakers
Video (cooking instructions?)
Automatic herb and spice rack
Smoke alarm

SC**A**MPER

Adapt

- Simply adapt an idea so that it accommodates a problem.

SCAMPER

Example:

Imagine it is 2050 and AI has developed so that it can interact more with people. Which professions will need to adapt?

SCAMPER

Ideas:

Counselling, teaching, law, GPs?

Finally for today: SCA**M**PER

Magnify

Make one aspect of your idea bigger or more pronounced.

Windows, sunroof, lawn

What happens when you magnify these?

SCA**M**PER

Windows – glass house

Sunroof – convertible car

Lawn – Indoor garden?

Create a **SCAM**PER brainstorm or grid. Can any of the ideas be applied to your project? If so, how?

Extension: complete research into anything you need to find out resulting from your brainstorm.

Bibliographic details of source	Information of source	Evaluation of source (WWWWH)	How might this be useful?

Recap:

- What are X and Y?
- What are *your* X and Y?
- What is problematizing the problem?
- What is SCAMPER?

Substitute
Combine
Adapt
Magnify
Put to other use
Eliminate
Rearrange

Today: SCAM**PER**

SCAM**P**ER

Put to another use.

SCAM**P**ER

Example: what use does a car windscreen have? What further use could it be put to?

SCAM**P**ER

Ideas: heater (for frost); video screen (only works when car engine is off)…

SCAMPER

Eliminate.

What happens when you take something away?

SCAMP**E**R

Examples: take away curtains from a room; chairs from an office; full stops from a poem

SCAMPER

No curtains: blinds, automatic tinting window
Chairs: higher desks?
Full stops: stream of consciousness style?

Lastly: SCAMPE**R**

Rearrange.

Put things in different places and see what happens.

Lastly: SCAMPE**R**

Example: Rearrange the set-up of a car.

Lastly: SCAMPE**R**

Idea: Driver at back (safer in a crash?)…

Create a SCAM**PER** brainstorm or grid. Can any of the ideas be applied to your project? If so, how?

Extension: complete research into anything you need to find out resulting from your brainstorm.

Bibliographic details of source	Information of source	Evaluation of source (WWWWH)	How might this be useful?

- Recap:
  - What are X and Y?
  - What are *your* X and Y?
  - What is problematizing the problem?
  - What is SCAMPER?

New Skill: How to ‘TRIZ’ a problem.

Brief History of TRIZ:

- Russian acronym translatable as ‘Theory of Inventive Problem-Solving’
- Invented by Genrich Altshuller in the 1940s
- Has been used on 1000s of designs for new products and inventions

Basic principles of TRIZ:

1. Look for **similar examples** of your problem-type being solved
2. Assess whether it is **applicable**

Example problem:

I want to find out whether the decision to go to War with Iraq followed the principles of utilitarianism.

TRIZ approach to problem:

1. Are there other examples of people judging political decisions using utilitarianism?
2. After research, I have found that Smith applied utilitarianism to the Gulf War.
3. I can use what Smith says to help me.

Create series of TRIZ-based research ideas:

- What kind of problem am I solving?
- What existing studies or designs solve similar problems?
- What can I learn from those existing studies and designs?

Today: Section 2
(Creative Thinking Section)

Before you start…
Why is B better than A?

A – I propose to solve the problem of water shortages by using drones to transport water.

B – I propose to solve the problem of water shortages by designing a long-distance, solar-powered drones with water-gathering technology inspired by firefighting helicopters

Before you start…

Why is B better than A?

A – I propose to help raise awareness about climate change by using the style of Picasso’s paintings in a painting of my own.

B – I propose to raise awareness about climate change by employing the themes, colours and cubist style of Picasso’s Guernica in my own artwork.

Tip: The Bs are better because they conduct detailed research into their *solution*.

Now work on Section 2 (researching or writing) Use the Create Project Guidance Sheet to help you

Reminders as you spend sessions working towards completion of Sections 1 and 2:

- Be innovative and imaginative
- Be specific when identifying your problem
- Make your project meaningful to you
- Use references when you use information from a source
- Use ‘I will use X to solve Y’
- Problematize your problem
- Subtract, multiply, unify
- Conduct detailed research into your *solution*

Share your ideas using this structure.

We propose to solve X using Y. Here are our main ideas for our Y:

1….

2….

3….

What problems remain? What have you not solved? What could you add? How could you refine your project?

Think, brainstorm, discuss, write.

Use your Creative Thinking Project Guidance Sheet to help you write your Section 3.

Section 4: Summarize

Aim for accuracy, mastery, precision.

Use your Creative Thinking Project Guidance Sheet to help