CAMELLIA
Community Water Management for a Liveable London

British Geological Survey

Lesson 1

Urban Water Cycle

or how do we get and use our local water

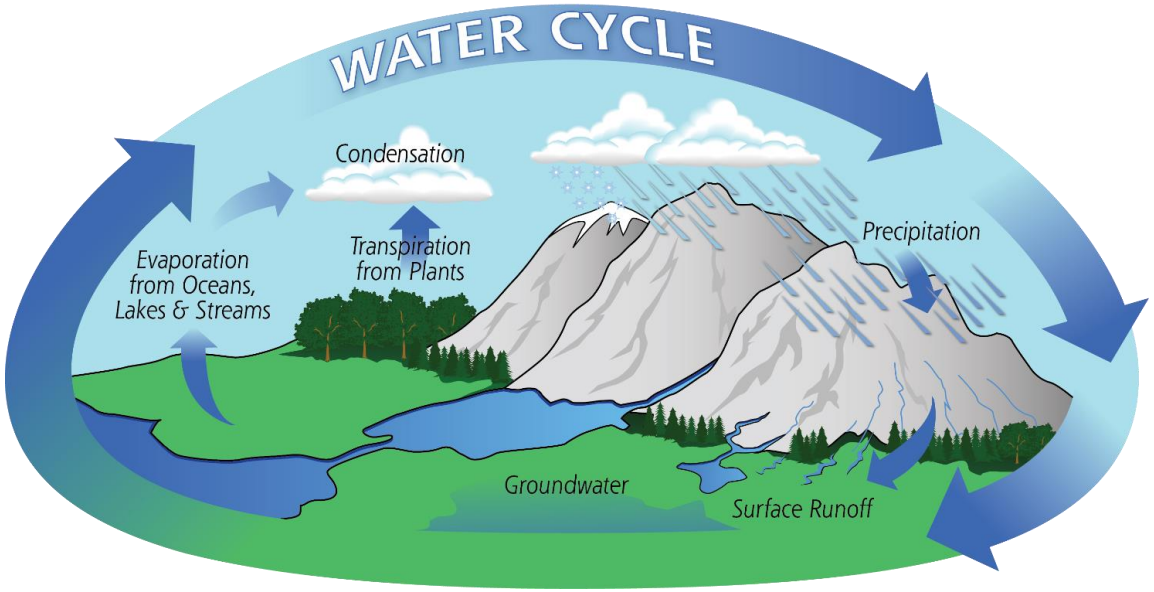
What is the difference, water cycle vs urban water cycle?

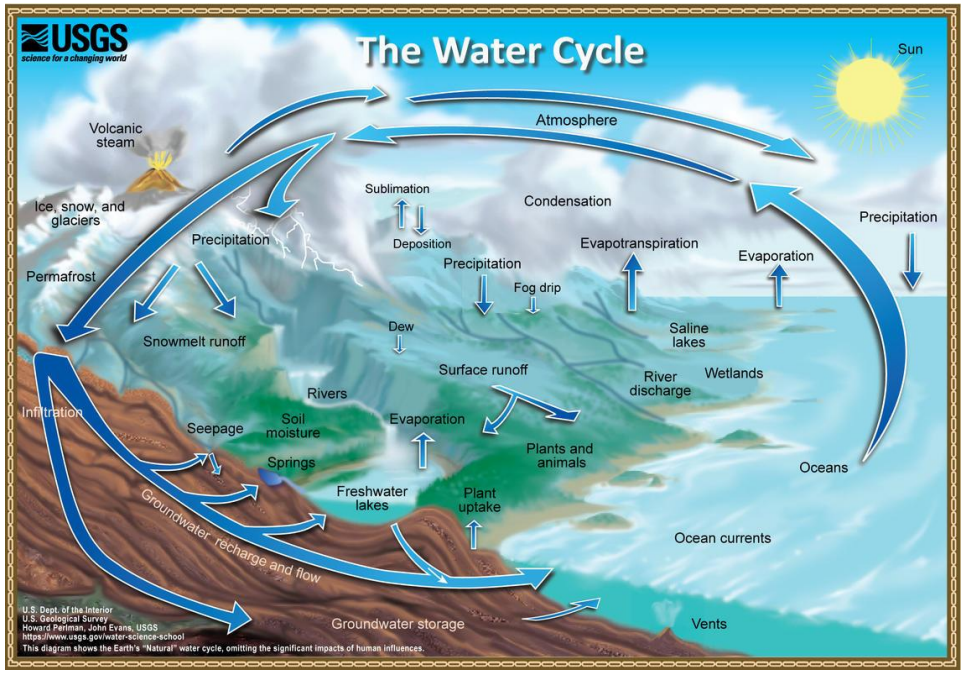
How is water moving through the city?

What do we use our local water for?

Do we ever use water that is not local, that is, the global water?

Water cycle – what is the difference between the two images? Which one is more accurate?

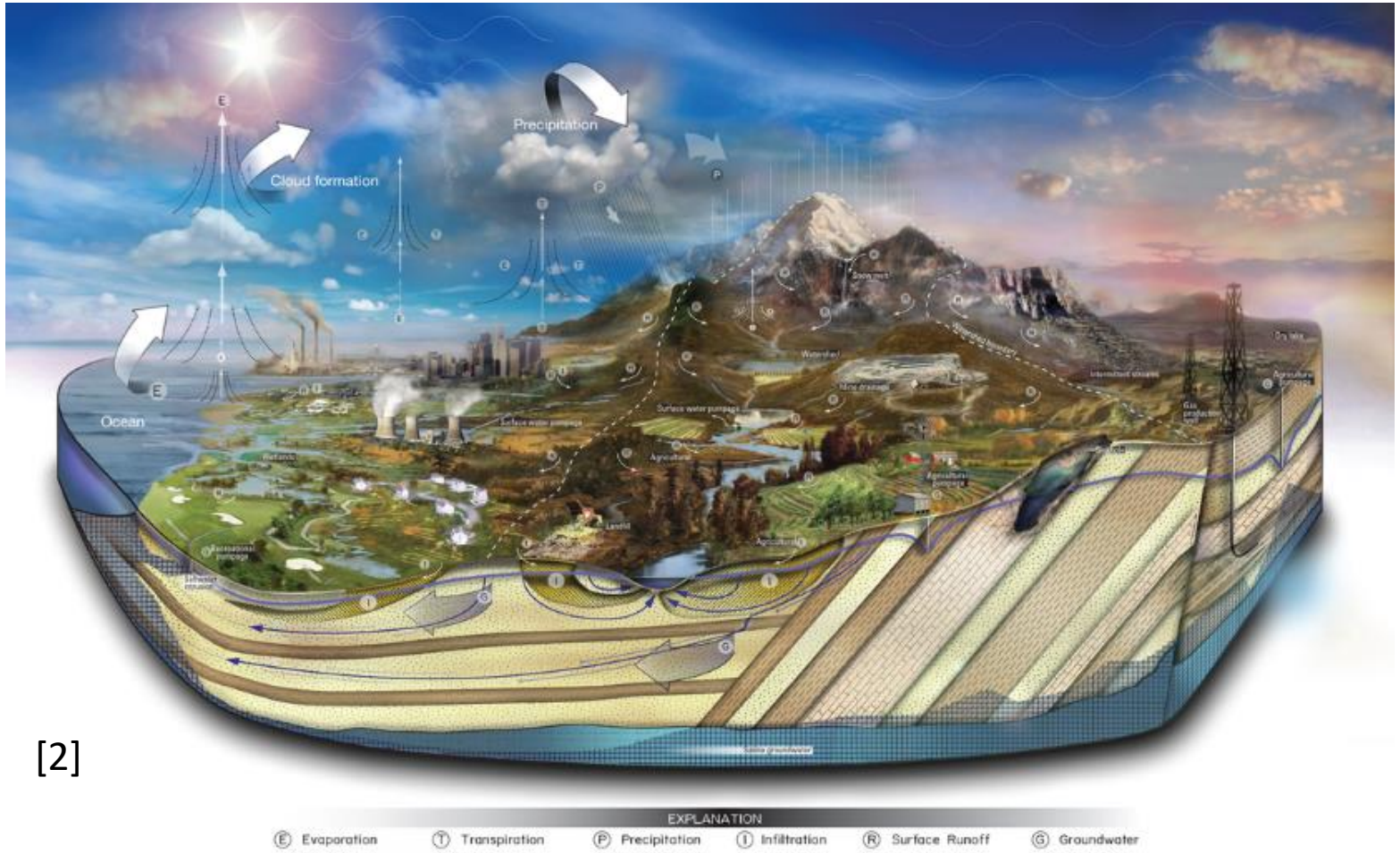




[1]

Do you see anything missing?

What is the difference between this image and the previous ones?



[2]

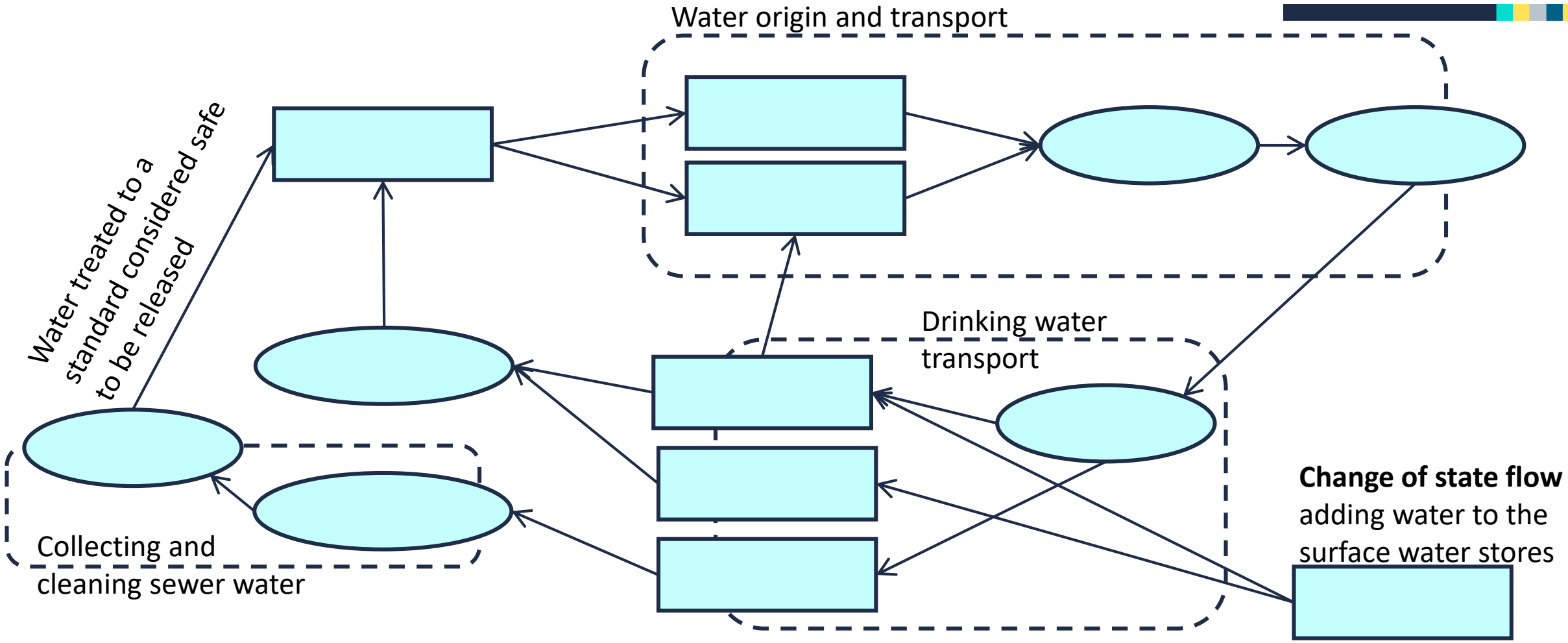
There is a considerable difference between your local and the global water cycle

- **Review your entrance homework**, which stores do you think are easily reached/close by from the place where you live?
- Your tap water comes directly from one or two of these stores, what do you think, which ones?

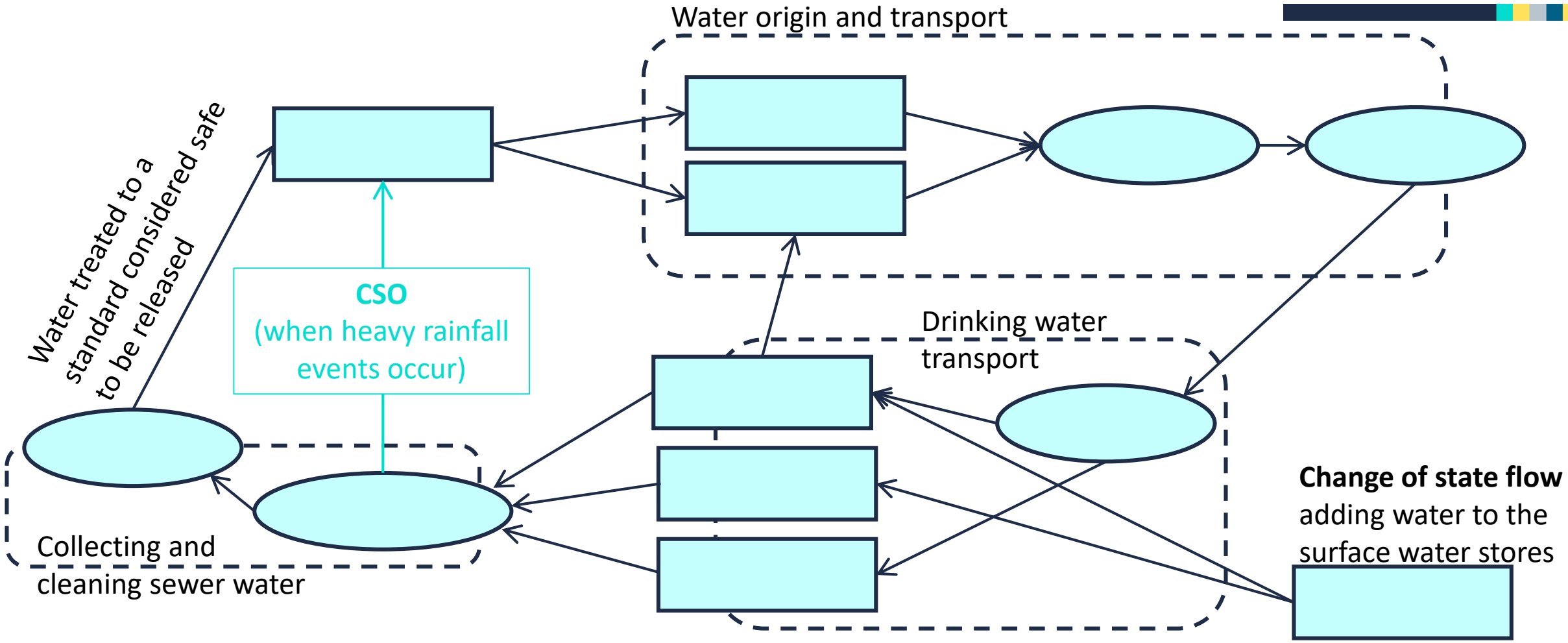
[3]

Would the water in your tap be a part of your local water cycle?

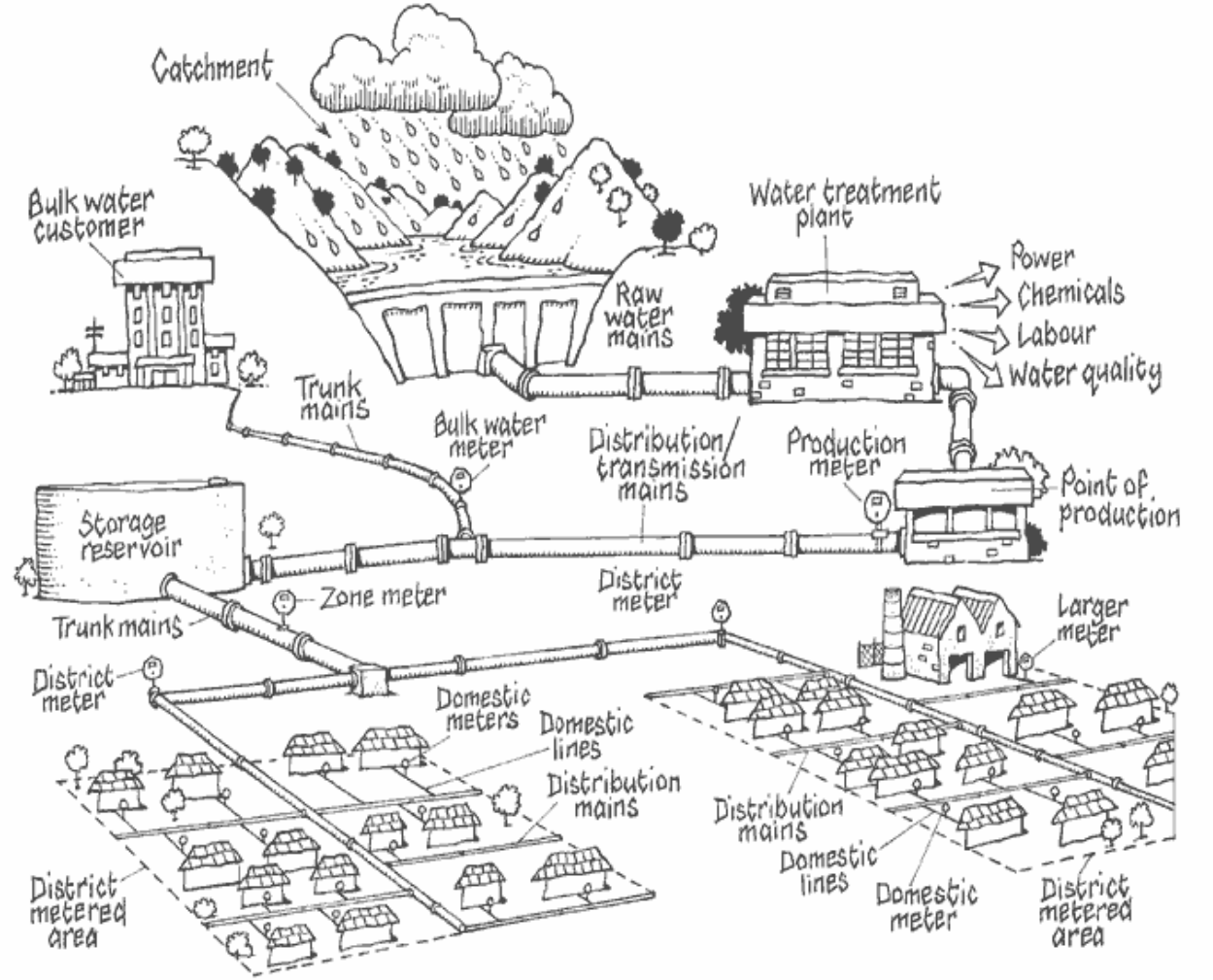
How does your local water cycle look?



How does your local water cycle look?



Water supply in a drawing:



[4]

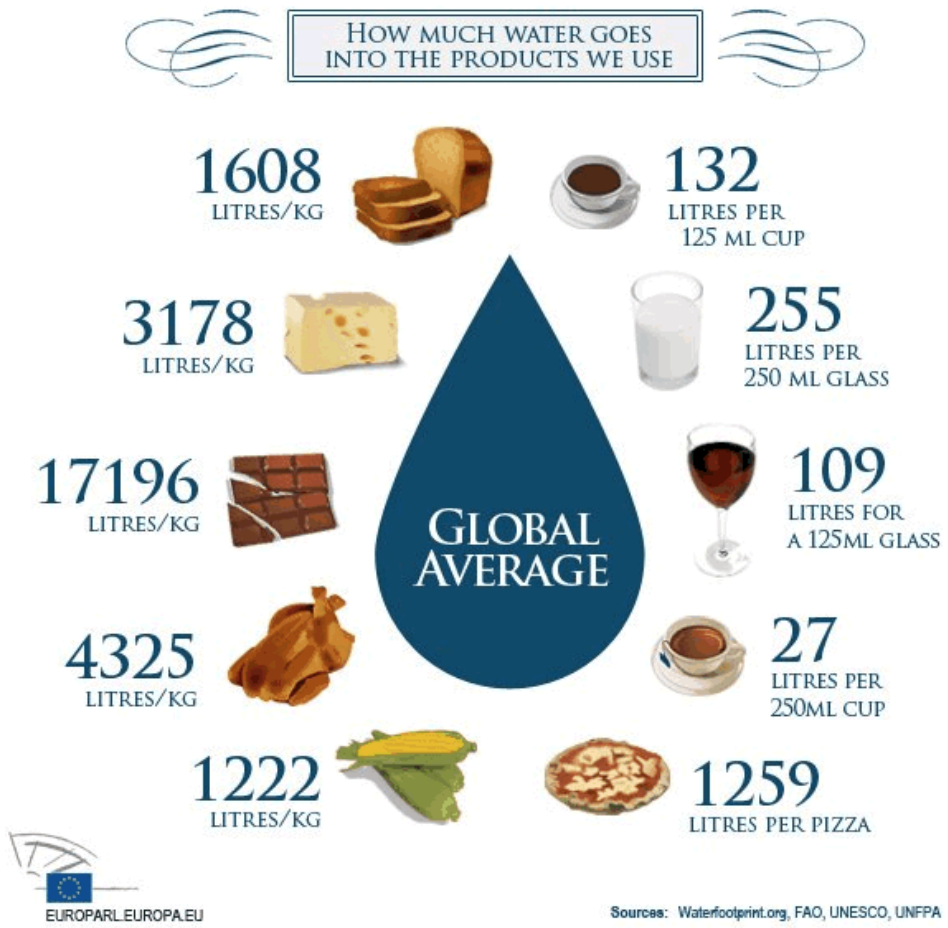
Where do you use water in your house?

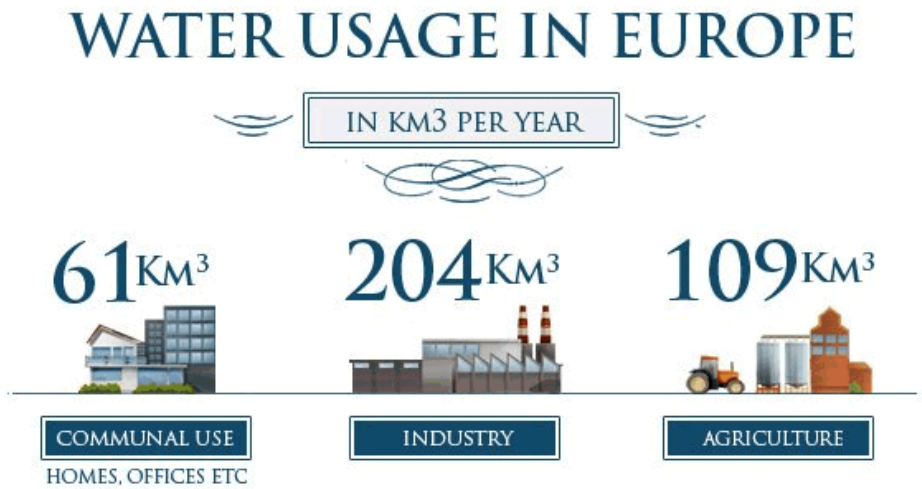
Do you use water that **is not local**?

Which of these items need water for their production?

[6]

WATER FOOTPRINT





[7]

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How is there water in your smartphone?

- Components of a smartphone are made of plastic, glass and metal, and each requires water in its production
- **Plastics:** derived from oil (extracted from the ground); in a refinery, oil is turned into pellets; pellets are formed into plastic parts;
- **Metals and minerals:** extracted in mines; in a refinery formed into metal pieces
- **Glass**: Made from silica, which is extracted in quarry; made into glass parts in a refinery

How much water is in your smartphone?

- Some sources* calculated that it takes **910 litres of water** per smartphone, but this is only to produce raw materials, not including the chip and other electrical components
- For comparison, **an average person in the UK uses 142 liters of water per day in their household****, which means that one person can live for almost a whole week on the water used to obtain the raw materials to produce one smartphone (on average in UK households would need **994 liters of water per week**)
- Once we include chip and electrical components into the water footprint equation, the amount of water used rises to **13 tones of water per smartphone (13 000 liters)*****

*source: http://emeliesandahl.com/portfolio-item/water-footprint-of-a-smartphone1/

**source: https://www.ccwater.org.uk/households/using-water-wisely/averagewateruse/

***source: https://policy.friendsoftheearth.uk/sites/files/policy/documents/2019-02/mind-your-step-report.pdf

Could you explain what is local vs global hydrological cycle?
Are the everyday things you use part of local or global hydrological cycle?

Notes:

- water on Earth is limited in its amount, we have all the water we will ever have

- the local hydrological cycle **is part of** the global hydrological cycle

Homework

Use water footprint calculator to calculate your water footprint. You can find the calculator online:

https://waterfootprint.org/en/resources/interactive-tools/personal-water-footprint-calculator/

- you will have to talk to parent/adult in the house to ask about family income. To simplify things, calculate the total income and divide it by the number of people in the household.

- note that the calculator requires you to put values in US dollars ($), to get this number multiply £ value with 1.36 to get the value in $.

In case you want a more detailed calculation here is the link to the extended version and ask your teacher for the instructions on how to fill this in: https://waterfootprint.org/en/resources/interactive-tools/personal-water-footprint-calculator/personal-calculator-extended/

Images

- [1] USGS water cycle - https://www.usgs.gov/media/images/water-cycle-natural-water-cycle
- [2]USGS water cycle #2 - https://www.usgs.gov/media/images/usgs-water-science-strategy-water-cycle
- [3] Tap water - http://arlingtonva.s3.amazonaws.com/wp-content/uploads/sites/4/2013/09/Tap-Water.jpg
- [4] Water distribution system - https://literatureoftruth.blogspot.com/2012/08/applications-of-pressure-in-liquids.html
- [5] Images for in house/garden water use:
  http://www.representingdads.com/2015/06/18/how-bright-does-your-ride-shine/
  http://www.woohome.com/outdoor/23-small-backyard-ideas-how-to-make-them-look-spacious-and-cozy
  http://www.ukbathroomguru.com/re-jigging-bathroom-allow-separate-shower-bath/
  https://www.mentalfloss.com/article/30358/australian-toilets-dont-flush-backwards-because-coriolis-effect
  http://butterbeliever.com/water-fluoridation-dangers/
  https://www.theshabbycreekcottage.com/clean-washing-machine.html
- [6] Images for indirect water use:
  https://external-content.duckduckgo.com/iu/?u=https%3A%2F%2Ftse2.mm.bing.net%2Fth%3Fid%3DOIP.OhVOqUWe1jkTtSO8mhA-gQHaE8%26pid%3DApi&f=1
  https://external-content.duckduckgo.com/iu/?u=https%3A%2F%2Ftse1.mm.bing.net%2Fth%3Fid%3DOIP.yMX7NaeFOaHm--4DSqCB7gHaFZ%26pid%3DApi&f=1
  https://classyyettrendy.com/wp-content/uploads/2018/02/My-Spring-2018-Capsule-Wardrobe-closet-full.jpg
  https://www.sheffield-systems.co.uk/telecoms/business-mobiles/
  https://external-content.duckduckgo.com/iu/?u=https%3A%2F%2Ftse3.mm.bing.net%2Fth%3Fid%3DOIP.ozdHp-j12N318ejbiPxZ7wHaEK%26pid%3DApi&f=1
- [7] Water footprint:
  http://stacyasher.com/GRPH_421_UNL_Spring_2014.html

Additional video resources:

- An Intro to Urban Wastewater Systems: https://www.youtube.com/watch?v=-HkRkCXPjzw
- Where Does Stormwater Go? https://www.youtube.com/watch?v=wdcXmerZWDc
- Water footprint https://www.youtube.com/watch?v=Wpm7cvGqI8g
- Where is water – water footprint https://www.youtube.com/watch?v=b1f-G6v3voA