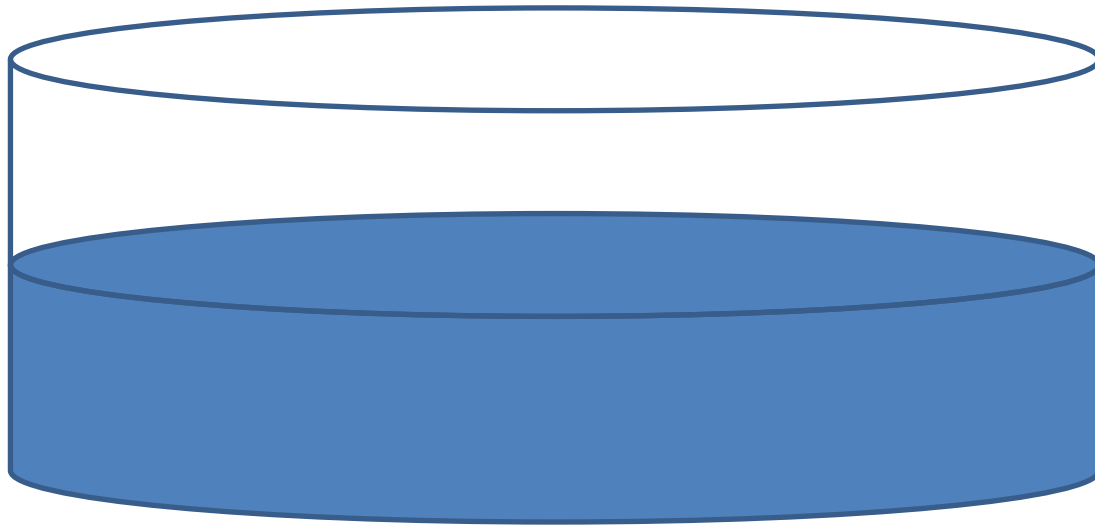
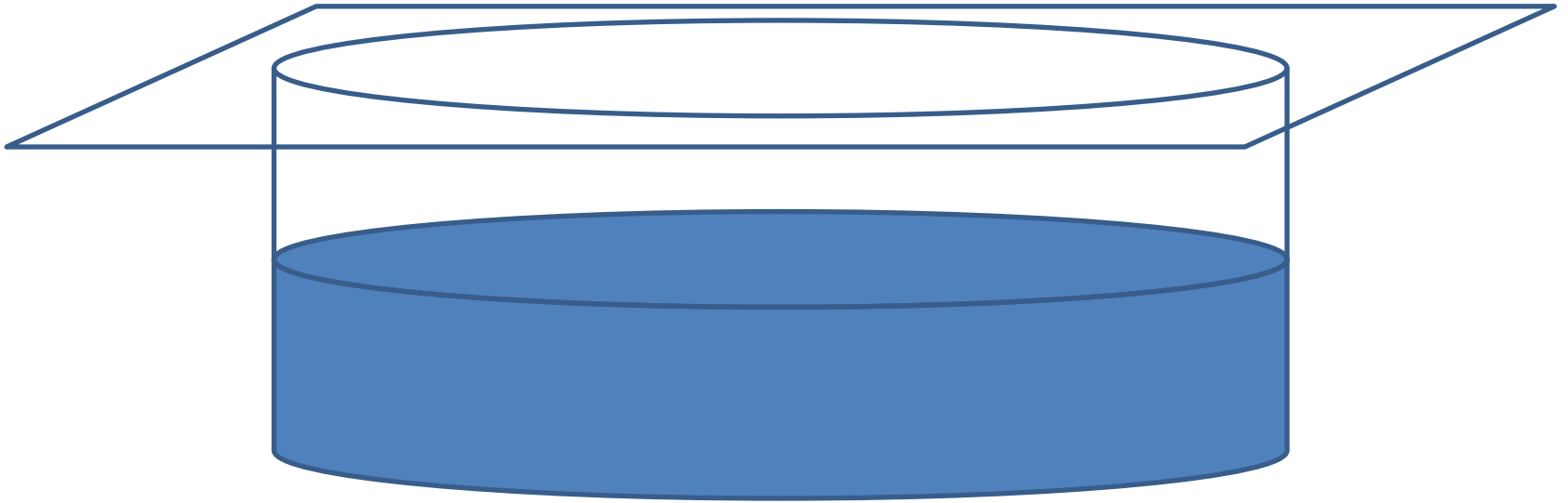


**Target – identify** patterns

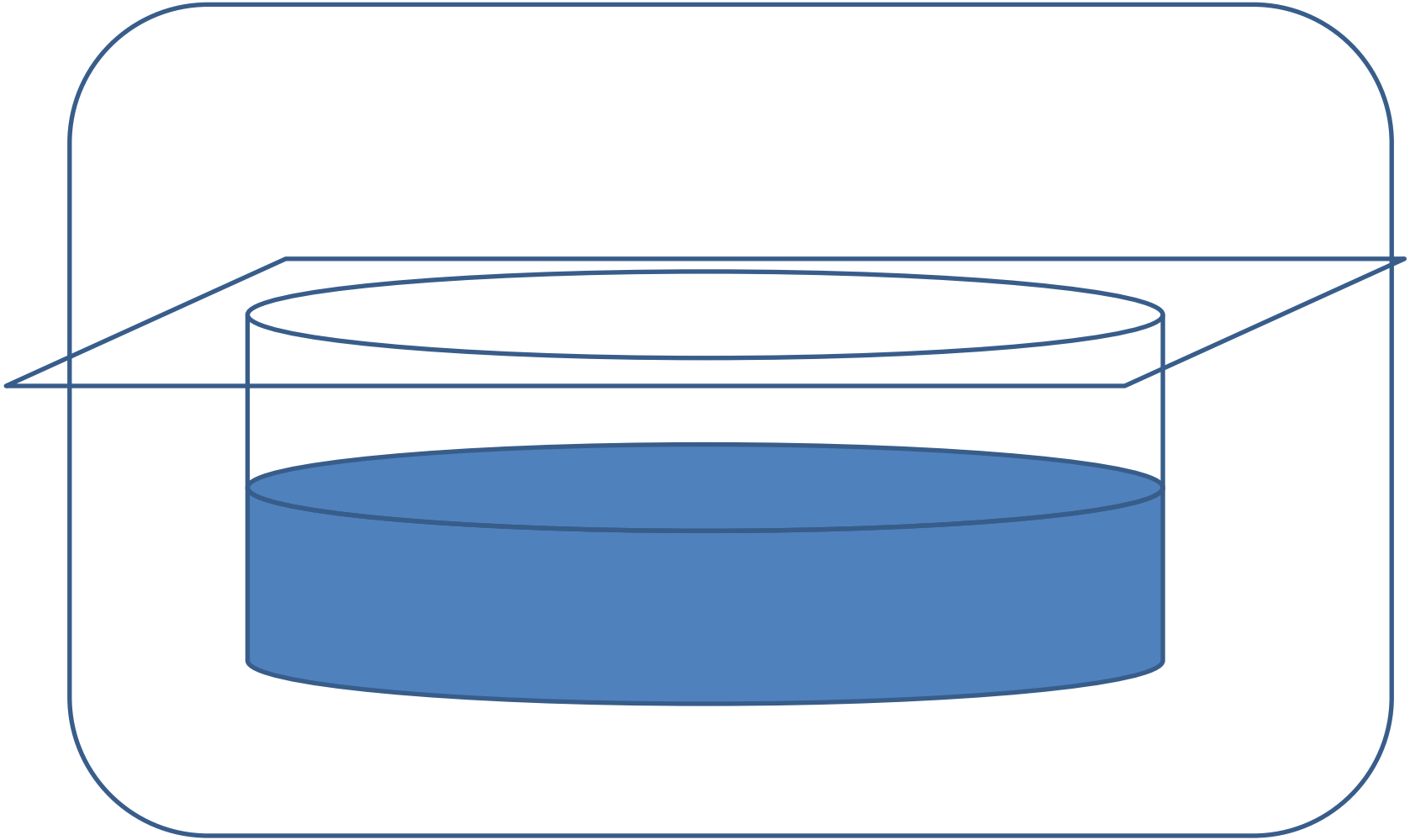
Start with a big dish of water .....



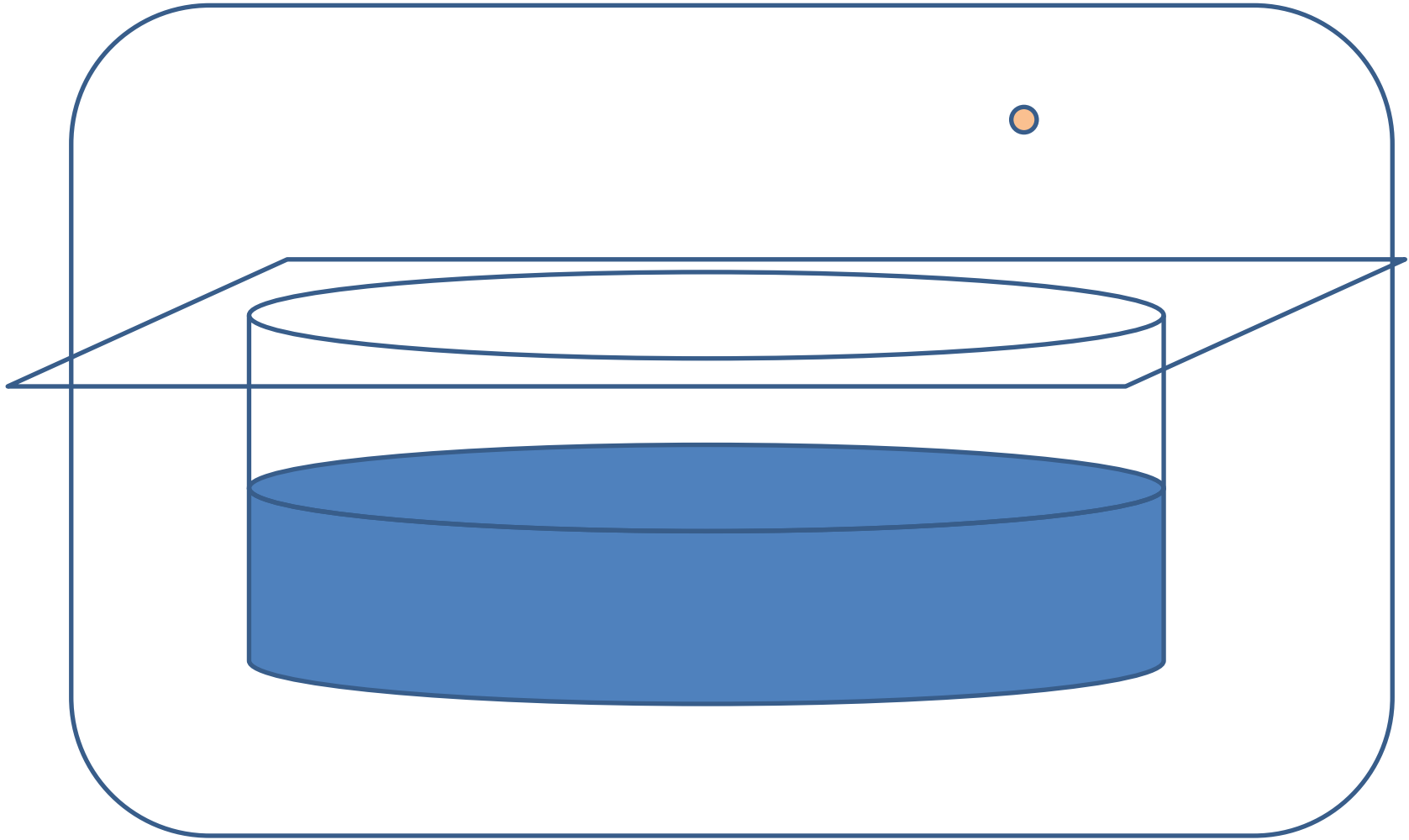
.....and a big lid .....



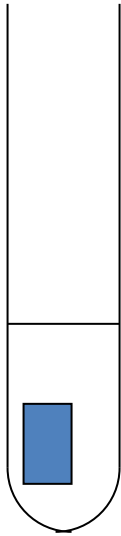
.....and a big safety screen .....



....and a tiny little bit of metal.



What about some **less explosive** mixtures?



magnesium

copper

calcium

zinc

# Reactions of metals in water

Metal	Reaction
Caesium	Explodes (not allowed to do!)
Potassium	Made gas which burned
Lithium	Made gas, zipped around
Sodium	Made gas, zipped around
Calcium	Produced bubbles of gas
Magnesium	Made bubbles on its surface
Zinc	No reaction





**Some metals react more than others with water.**

**The order is –**

**Caesium (Cs)**

**Potassium (K)**

**Lithium (Li)**

**Sodium (Na)**

**Calcium (Ca)**

**Magnesium (Mg)**

**Zinc (Zn)**

Some metals react more than others with water.

The order is –

Caesium (Cs)

Potassium (K)

Lithium (Li)

Sodium (Na)

Calcium (Ca)

Magnesium (Mg)

Zinc (Zn)

### Periodic Table of Elements

1A	1																			0	
	1	H																			He
	2	Li	Be																		
	3	Na	Mg	III B	IV B	V B	VIB	VII B	VIII	VII	IB	IB	III A	IV A	V A	VIA	VII A				
	4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr		
	5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe		
	6	Cs	Ba	*La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn		
	7	Fr	Ra	+Ac	Rf	Ha	106	107	108	109	110										

* Lanthanide Series	58	59	60	61	62	63	64	65	66	67	68	69	70	71
	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
+ Actinide Series	90	91	92	93	94	95	96	97	98	99	100	101	102	103
	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Legend - click to find out more...

<b>H - gas</b>	<b>Li - solid</b>	<b>Br - liquid</b>	<b>Tc - synthetic</b>
Non-Metals	Transition Metals	Rare Earth Metals	Halogens
Alkali Metals	Alkali Earth Metals	Other Metals	Inert Elements

Some metals react more than others with water.

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Caesium (Cs)

Potassium (K)

Sodium (Na)

Lithium (Li)

Calcium (Ca)

Magnesium (Mg)

Zinc (Zn)

**Periodic Table of Elements**

1	2																	3																							
1	2	3	4																	5	6	7	8	9	10																
11	12	13	14	15	16	17	18																	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86						
87	88	89	104	105	106	107	108	109	110																	111	112	113	114	115	116	117	118								

\* Lanthanide Series

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu

+ Actinide Series

90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Legend - click to find out more...

The further to the \_\_\_\_\_ in the table, the more reactive you are.

Some metals react more than others with water.

The order is –

Caesium (Cs)

Potassium (K)

Sodium (Na)

Lithium (Li)

Calcium (Ca)

Magnesium (Mg)

Zinc (Zn)

### Periodic Table of Elements

1	2																	10						
3	4																	10						
11	12	13	14	15	16	17	18																	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36							
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54							
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86							
87	88	89	104	105	106	107	108	109	110															

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	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
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Legend - click to find out more...

The further \_\_\_\_\_ the table, the more reactive you are.

Some metals react more than others with water.

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Potassium (K)

Sodium (Na)

Lithium (Li)

Calcium (Ca)

Magnesium (Mg)

Zinc (Zn)

**Periodic Table of Elements**

1	2																	3							
1	2	3	4																	5	6	7	8	9	10
2	3	4																	5	6	7	8	9	10	
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18										
4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19										
5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20										
6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21										
7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22										

\* Lanthanide Series

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu

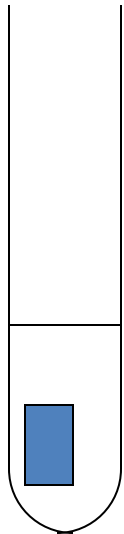
+ Actinide Series

90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Legend - click to find out more...

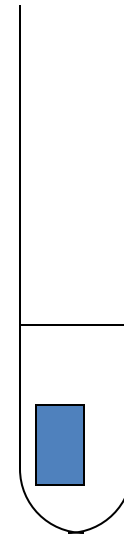
The further to the \_\_\_\_\_ of the table, the more reactive you are.

# Do metals react more in **acid** or **water**?

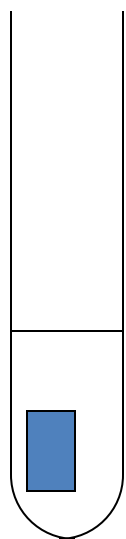


Magnesium  
in water

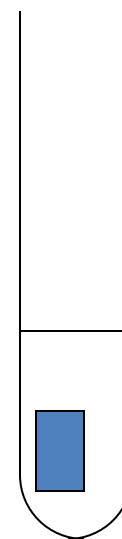
Magnesium  
in acid



# Do metals react more in **acid** or **water**?



Magnesium  
in water

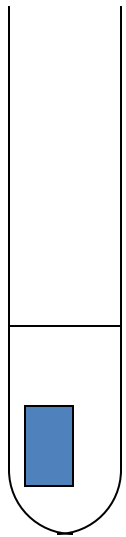


Magnesium  
in acid

The magnesium produced gas **faster** in the acid than in the water.

Metals react **faster** in acid than in water.

# How do metals react in **acid**?



1/3 of a test tube  
of acid

metal  
in acid

Zinc

Iron

Copper

Tin

Lead

Magnesium

Place the metals in order – least reactive first.



The order of reactivity in acid is -

Magnesium

Aluminium

Zinc

Iron

Tin

Lead

Copper.

*So far we know –*

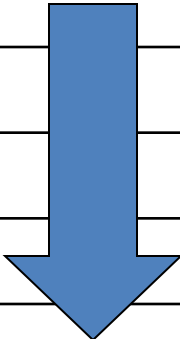
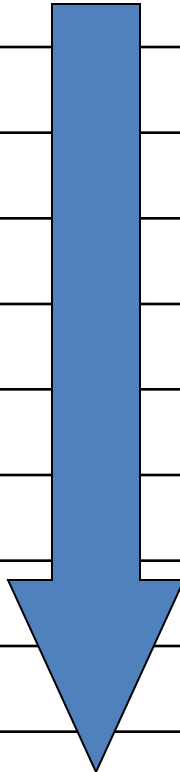
Metals react with **oxygen, water** and **acids**.

Metals react **more easily in acids** than water.

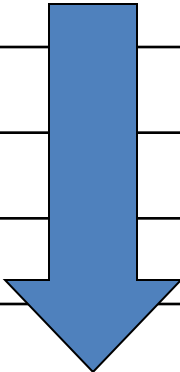
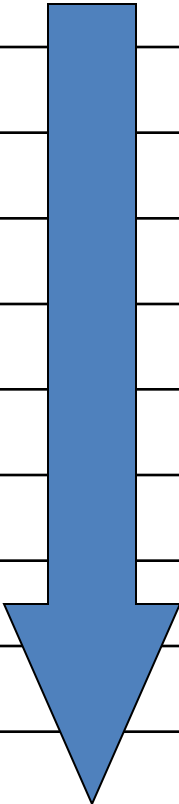
Different metals have **different reactivities** (how easily they react)

Metals can be arranged into a **reactivity series**

# Reactivity of metals

React with water	Metal	React with acid
	caesium	
	potassium	
	sodium	
	lithium	
	calcium	
	magnesium	
	aluminium	
	zinc	
	iron	
	tin	
	lead	
	copper	
	Sliver, gold	

# Reactivity of metals

React with water	Metal	React with acid
	caesium	
	potassium	
	sodium	
	lithium	
	calcium	
magnesium		
aluminium		
zinc		
iron		
tin		
lead		
copper		
Sliver, gold		

## How metals react

Some metals reacted when we put them in water. We knew they were reacting because they \_\_\_\_\_, there was a \_\_\_\_\_ noise and they made \_\_\_\_\_ appear.

Other metals only reacted when we put them in \_\_\_\_\_. Metals reacted faster in \_\_\_\_\_ than they did in \_\_\_\_\_.

The order of metals reacting was –

Metals at the **left** of the table are \_\_\_\_\_ reactive.

Metals at the **bottom** of the table are \_\_\_\_\_ reactive.