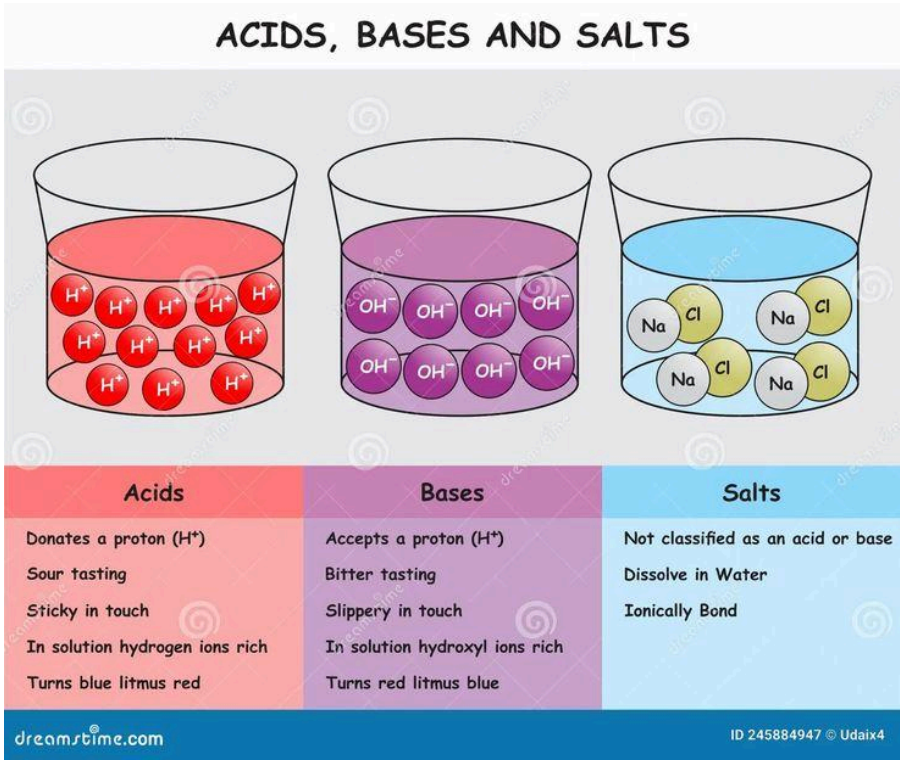
STEAM EDUCATION
CLASS-7

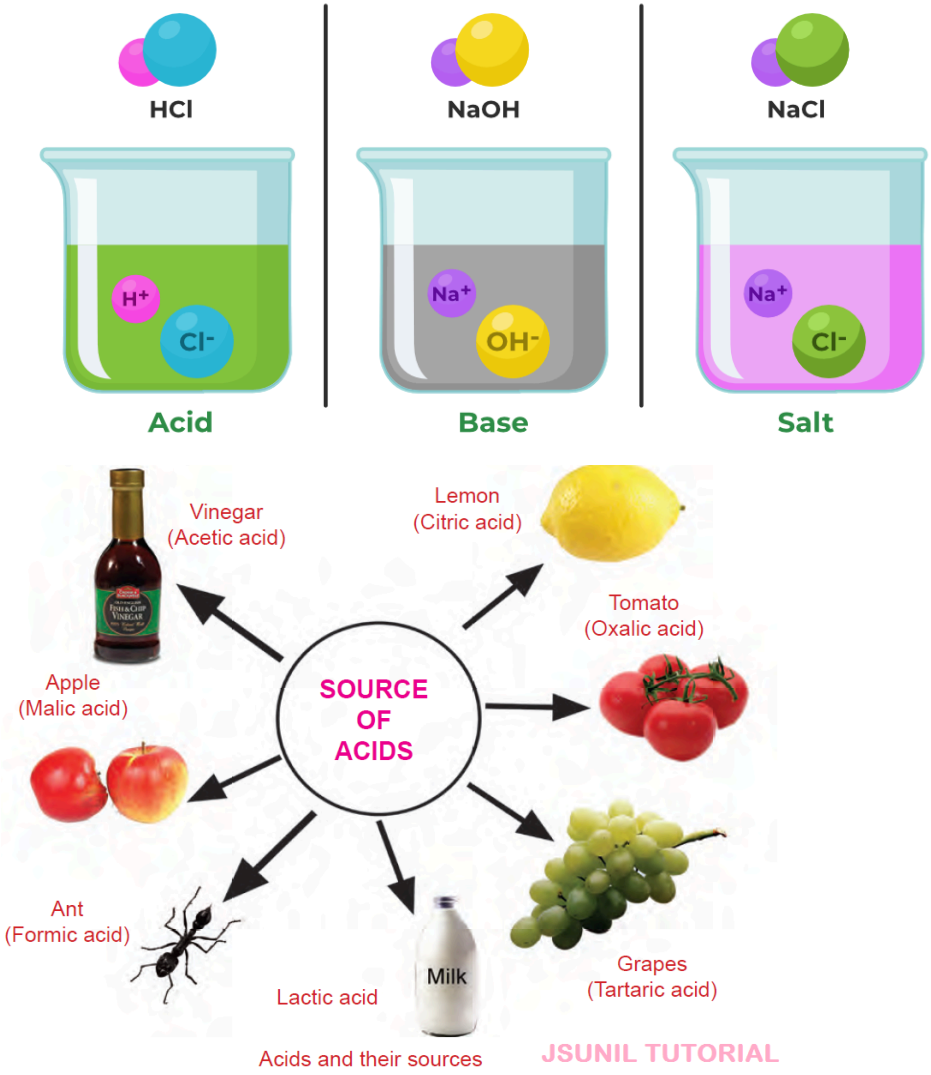
SCIENCE

Chapter- acids, bases and salts

"Acids end in -ic or -ous too,
HCl is hydrochloric, that's what to do.
Bases end in -hydroxide, don't you forget,
NaOH is sodium hydroxide, you won't regret.

Salts are formed when acids and bases combine,
NaCl is sodium chloride, all the time!
H+ and OH- ions, they switch places fast,
Forming salts and water, that's the reaction at last!”





Chapter- electricity

"Volts are the force, that makes it all flow,
Amps are the current, don't you know?
Ohm's law is key, to understand it all,
V=IR, the formula, standing tall!

Series and parallel, circuits so fine,
Switches and conductors, all in line.
Insulators too, to keep it safe and sound,
Electricity basics, spinning round and round!"

Chapter- time and motion

"Distance and displacement, don't get them mixed,
Speed and velocity, with direction fixed.
Acceleration's the change, in velocity so fine,
m/s² is the unit, all the time!

Time and motion, closely tied,
Second, minute, hour, side by side.
Speed = Distance/Time, the formula so grand,
Motion and time, hand in hand!”

ACRONYMS-

Distance, Speed, and Acceleration
1. DASH
   - D: Distance = Speed × Time (D = S × T)
   - A: Acceleration = Change in Velocity / Time (a = Δv / t)
   - S: Speed = Distance / Time (S = D / T)
   - H: Hour (time unit)

Formula: Speed = Distance/Time
1. SDT Formula
   - Speed = Distance / Time (S = D / T)

Velocity and Acceleration
1. VAM Formula
   - Velocity = Acceleration × Mass / Time (v = a × m / t) or
   - Velocity = Acceleration × Time (v = a × t) or
   - Velocity = Distance / Time (v = d / t)

Motion and Time

Slow and Fast Motion

The distance moved by the objects in agiven interval of time can help us to provide the fast or slow motion

Units

Time: Measures in Second

Speed: Measured by speedometer in m/S^{-1}

Odometer: Measure the distance moved by the vehicle

Day: Time between sunrise and the sunset

Month: One new month to the next.

Year: Fixed time taken by the earth to complete on revolution of the sun.

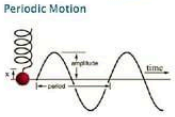
Types of Motion

Meaning: The action or process of moving or being moved

Uniform Motion: Object moving along a straight line with a constant speed

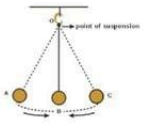
Non-Uniform Motion: Speed of an object moving along a straight line keeps changing

Periodic Motion: When Bob of pendulum starts to move from its mean position to extreme position.



Oscillations: Back and Forth movment of a bob following rhythmic pattern

Oscillatory motion



EduRev

TECHNOLOGY AND ENGINEERING

Topic- Number system

"Binary counts just 0 and 1,
Octal steps up, using three for fun.
Decimal's our everyday friend,
Ten fingers help us to the end.
Hexadecimal adds more flair,
Sixteen digits everywhere!"

Acronym for Ethics and Safety Measures

S.C.R.E.A.M.
Secure
Click
Respect
Ethics
Awareness
Mindfulness
"S.C.R.E.A.M. is the way to be,
Stay safe and secure on the web, you'll see!"

DBMS- SQL

Acronym for SQL Aggregate Functions

S.A.M. C.A.R.
SUM
AVG
MIN
COUNT
AVG
RANGE
"S.A.M. C.A.R., remember this to go far!
Sum, Average, Count, and Range,
SQL makes data easy to change!"

Acronym for Date Functions

D.A.T.E.
DATE_ADD
ADD_DAYS
TODAY (CURRENT_DATE)
EXTRACT (YEAR, MONTH, DAY)
"D.A.T.E., with time at your gate,
Add, extract, and keep it straight!"

ARTS

Topic- Climate

C.L.I.M.A.T.E.

C hilly winds, thandi hawa, poles pe barf ki chaadar,
L ush green jungle, baarish zyada, tropical hai ye kadar.
I n deserts, garmi tezz, balu ka ye shahar,
M ountains high, snowflakes girte, thand ka hai asar.
A utumn aaye, patte girte, temperate ka rang,
T ropical monsoon, pani barsaye, nadiyan banein sang.
E ver-changing, duniya bhar mein, har jagah ka mood,

Mausam badle, climate ghoome, nature ka ye rule!

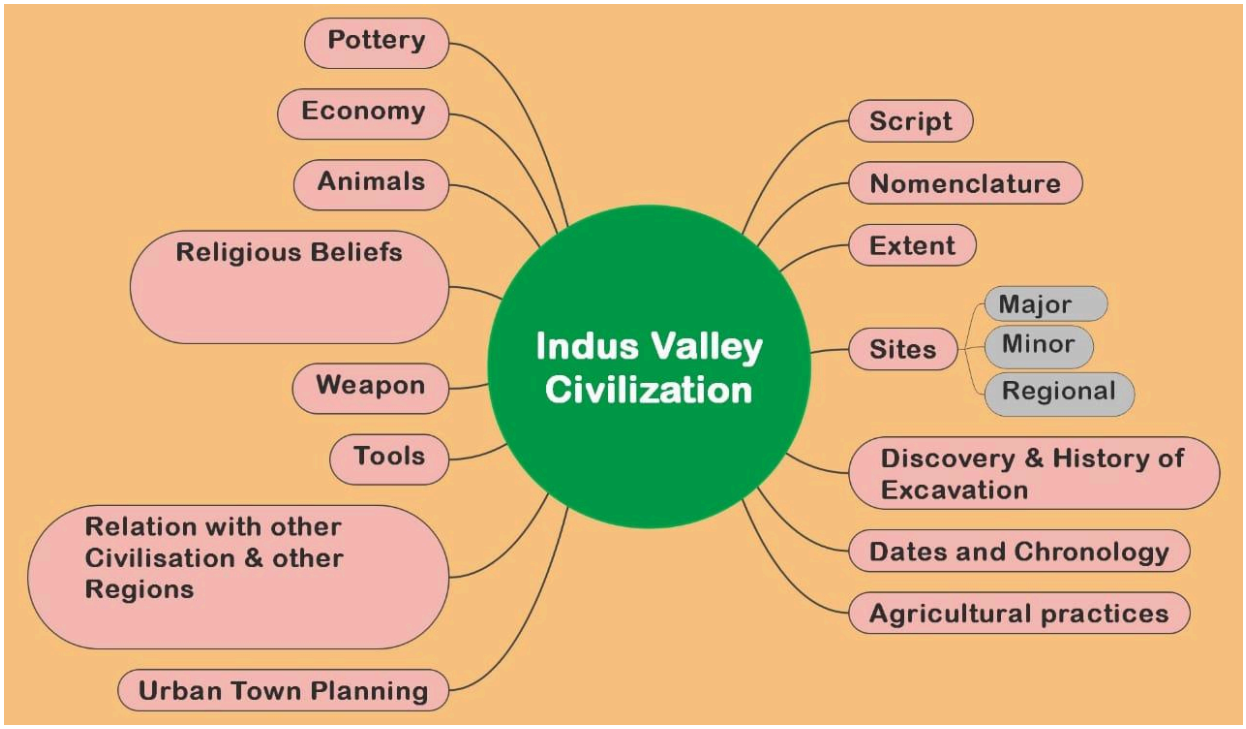
Acronyms for factors affecting climate-
WORLD
- Wind direction,
- ocean currents,
- relief,
- latitude,
- distance from the sea

Acronyms for geographical distribution/patterns/locations
CLOCCK –
- Continent,
- Latitude/Longitude,
- Ocean/sea,
- Country,
- Compass,
- Kilometre

S.O.I.L. Jingle

S andy soil, zameen hai dhili, paani jaldi beh jaye,
O rganic black, sabse upjaoo, kheti ke kaam aaye.
I n *C* lay soil, mitti hai geeli, paani ko rok sake,
L oamy best, sabka mix hai, fasal yahan ache ug sake!

World is based on G.R.A.P.E.S
G for Geography
R for Religion
A for Architecture
P for Politics and Policies
E for Economics
S for Social Structure



MATHEMATICS

Chapter-
Triangles and its properties
Congruence of Triangles

Short Story
Once upon a time, in a magical kingdom, there lived three friends - SAS, ASA, and SSS. They loved to play with triangles.

SAS (Side-Angle-Side) was very particular about his triangle's sides and angles. He would always check if two sides and the included angle were equal.

ASA (Angle-Side-Angle) was a bit different. He would check if two angles and the included side were equal.

SSS (Side-Side-Side) was the most laid-back. He would simply check if all three sides were equal.

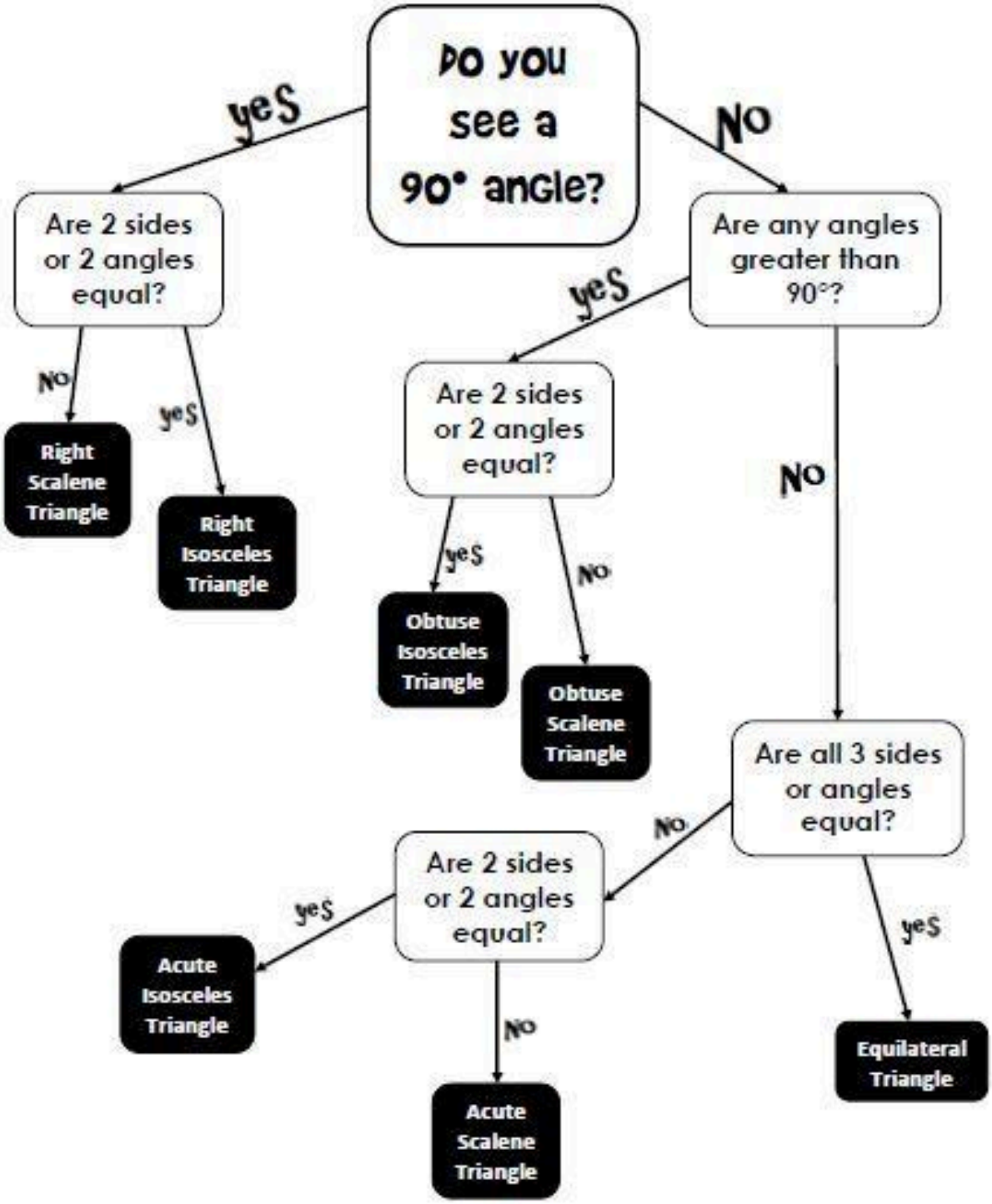
One day, they stumbled upon a mysterious triangle. SAS checked the sides and angles, ASA checked the angles and side, and SSS checked all three sides. To their surprise, all three methods proved that the triangle was congruent!

From that day on, SAS, ASA, and SSS became known as the "Congruence Trio," and their methods were used by triangle enthusiasts throughout the kingdom.

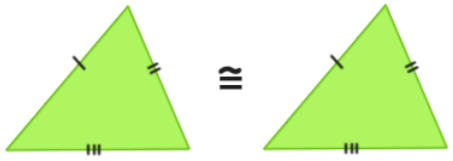
Acronym
1. SAS - Side-Angle-Side
2. ASA - Angle-Side-Angle
3. SSS - Side-Side-Side

C.A.R.S.
C - Corresponding parts (angles or sides)
A - Angle or side equality
R - Rigorous checking (using SAS, ASA, or SSS)
S - Same shape, same size (congruent triangles)

Classifying Triangles

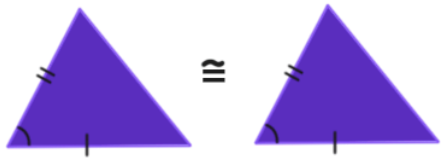


SSS (side-side-side)



3 sides are respectively equal

SAS (side-angle-side)

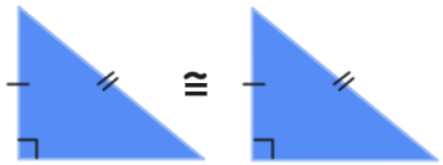


2 sides are included
angles are respectively equal

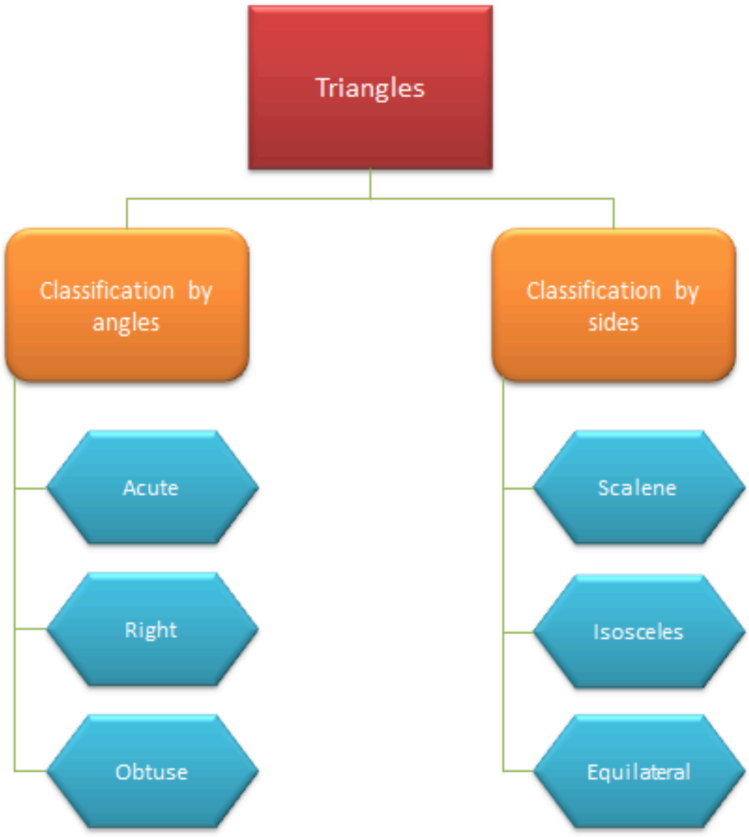
ASA (angle-side-angle)

2 angles and the included side
are respectively equal

RHS (right angle-hypotenuse-side)



Hypotenuse and one side are
respectively equal



Chapter- Exponents and Powers

"Exponents and powers, a math delight
Follow these rules, and you'll shine so bright

Power of a power, multiply the exponents too
(a^m)^n = a^(m*n) that's what to do

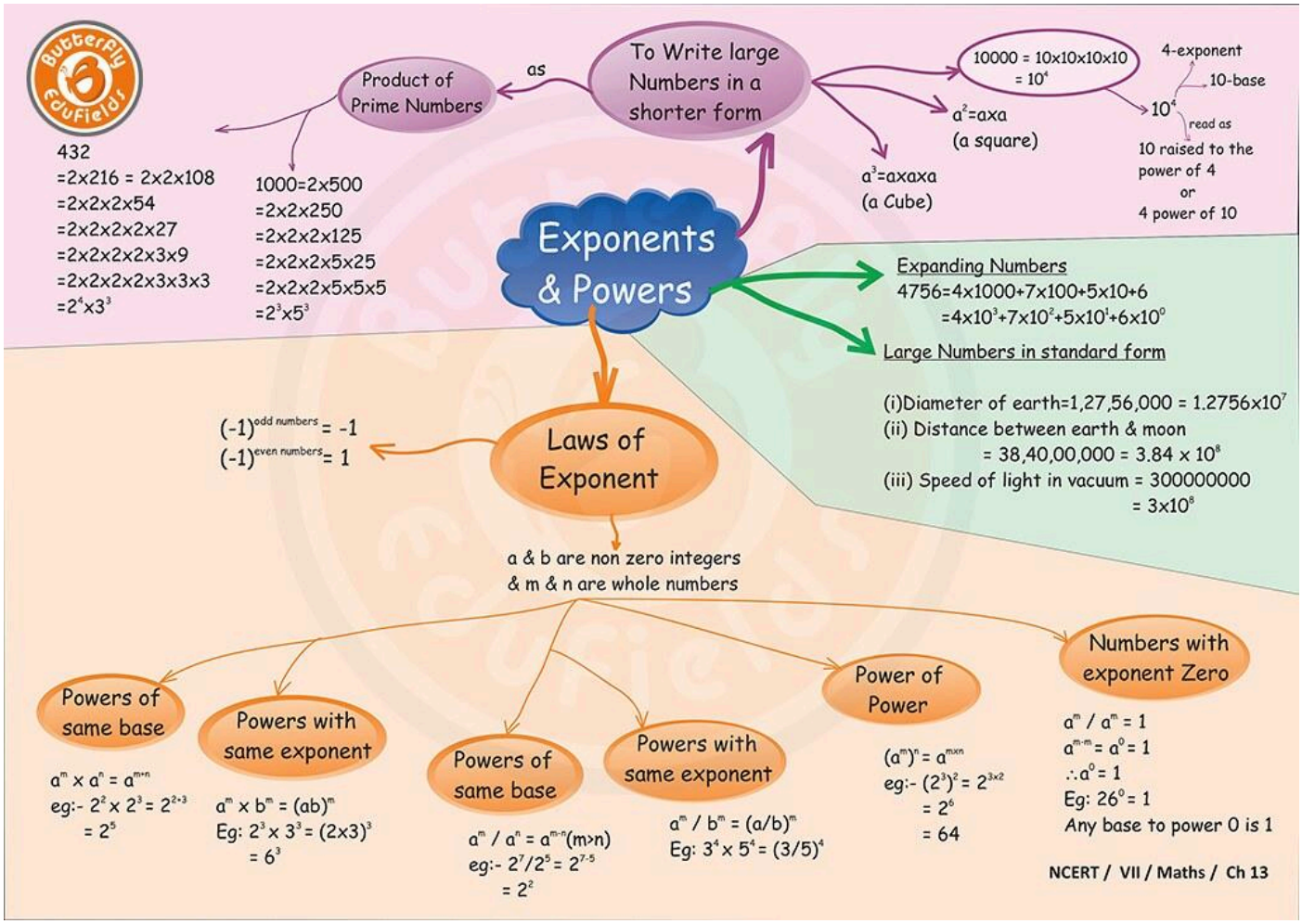
Power of a product, distribute with care
(a*b)^m = a^m * b^m, show you dare

Power of a quotient, divide with ease
(a/b)^m = a^m / b^m, if you please

Negative exponent, flip and change the sign
a^(-m) = 1/a^m, all the time

Zero exponent, one is the key
a^0 = 1, don't you see?

Exponents and powers, now you know the score
Follow these rules, and you'll ask for more!”


Butterfly EduFields
Exponents & Powers
To Write large Numbers in a shorter form
as
Product of Prime Numbers
432
=2x216 = 2x2x108
=2x2x2x54
=2x2x2x2x27
=2x2x2x2x3x9
=2x2x2x2x3x3x3
=2^4x3^3
1000=2x500
=2x2x250
=2x2x2x125
=2x2x2x5x25
=2x2x2x5x5x5
=2^3x5^3
10000 = 10x10x10x10 = 10^4
4-exponent
10-base
read as
10 raised to the power of 4
or
4 power of 10
a^2=axa
(a square)
a^3=axaxa
(a Cube)
Expanding Numbers
4756=4x1000+7x100+5x10+6
=4x10^3+7x10^2+5x10^1+6x10^0
Large Numbers in standard form
(i)Diameter of earth=1,27,56,000 = 1.2756x10^7
(ii) Distance between earth & moon
= 38,40,00,000 = 3.84 x 10^8
(iii) Speed of light in vacuum = 300000000
= 3x10^8
Laws of Exponent
(-1)^odd numbers = -1
(-1)^even numbers = 1
a & b are non zero integers
& m & n are whole numbers
Powers of same base
a^m x a^n = a^m+n
eg:- 2^2 x 2^3 = 2^2+3
= 2^5
Powers with same exponent
a^m x b^m = (ab)^m
Eg: 2^3 x 3^3 = (2x3)^3
= 6^3
Powers of same base
a^m / a^n = a^m-n (m>n)
eg:- 2^7/2^5 = 2^7-5
= 2^2
Powers with same exponent
a^m / b^m = (a/b)^m
Eg: 3^4 x 5^4 = (3/5)^4
Power of Power
(a^m)^n = a^mxn
eg:- (2^3)^2 = 2^3x2
= 2^6
= 64
Numbers with exponent Zero
a^m / a^m = 1
a^m-m = a^0 = 1
∴a^0 = 1
Eg: 26^0 = 1
Any base to power 0 is 1
NCERT / VII / Maths / Ch 13

THE RULES OF EXPONENTS

PRODUCT RULE

$$a^m \cdot a^n = a^{m+n}$$

QUOTIENT RULE

$$\frac{a^m}{a^n} = a^{m-n}$$

NEGATIVE RULE

$$a^{(-m)} = \frac{1}{a^m}$$

POWER OF A POWER

$$(a^m)^n = a^{m \cdot n}$$

POWER OF A PRODUCT

$$(ab)^m = a^m b^m$$

POWER OF A QUOTIENT

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

ZERO RULE

$$a^0 = 1$$

FRACTIONAL EXPONENTS

$$a^{\frac{m}{n}} = \sqrt[n]{a^m}$$