

A vulgar fraction in its lowest terms cannot be reduced to a *terminating* decimal if its denominator contains any other prime factor than 2 or 5.

No number ending in 2, 3, 7 or 8 is ever a perfect square.

No number ending in 5 is a perfect square except the ten's digit is 2.

Note the result of multiplying 12345679 by 9 or any multiple of 9 up to 90. *Ex.*— $12345679 \times 36 = 444444444$.

Turn $\frac{1}{2}$, $\frac{3}{4}$, $\frac{5}{8}$, $\frac{7}{16}$, $\frac{9}{32}$ into decimals in the order here given, arrange the results under each other, and carefully note the transpositions.

NOTES AND HINTS IN PHYSICAL GEOGRAPHY.

Dew appears chiefly where it is most wanted, on herbage and low plants, avoiding, in a great measure, rocks, bare earth, and water. Explain the cause of this.

When dew is deposited on bodies cooled below the freezing point, it is solidified into hoar frost.

Dew is formed more freely on a clear night, because clouds radiate back the heat intercepted by them in its progress from the earth upwards.

Dew is formed more freely on a calm night, because any agitation of the atmosphere tends to send continually currents of warmer air, which will replace the heat that substances lose by radiation.

Grass, on a clear and calm night, is much colder than the gravel or earth by its side, because heat is conducted better to the latter from the earth below.

From the moist and warm soil vapor rises, spreads itself with the cooler air, and is condensed into small aqueous particles, which float in the air, and become visible as mist or fog.

Clouds are formed from the condensed vapors rising from the earth, and differ from mist only in occupying higher regions of the atmosphere. When this watery vapor becomes more condensed, the particles unite and fall as rain.

Snow is vapor suddenly condensed into the solid state.

Hail is formed out of rain-drops, that freeze as they fall through colder regions.

The south wind is moist and warm, and mixing with the colder air of the northern regions results in clouds and rain.

The mists on low-lying marsh lands in the evening are caused by the rapid cooling of the air when the sun has set.

The morning mist over rivers and lakes is caused by the water cooling much more slowly than the air that is in contact with it.

THE TRADE WINDS.

THE air about the equator is heated, expands, and rises, its place being supplied by air moving towards the equator from the poles. Hence there is a constant current of air above setting from the equator, and a constant current below setting towards the equator. The lower current forms what is called *trade winds*, which are felt for 30° of latitude on each side of the equator. If the earth were at rest these winds would set due north and south; but as the earth's surface, revolving from west to east, has its greatest velocity at the equator, and this velocity gradually decreases from the equator to the poles, the currents from the north and south are constantly acquiring a motion from east to west relative to the place over which they are passing; and this motion, combined with their original motion from north to south, and from south to north, produces a permanent north-easterly current in the northern hemisphere, and a south-easterly current in the southern hemisphere.

SYNONYMS.

AN ungraceful repetition of the same word several times in a sentence not only destroys its beauty, but denotes a poverty of language. While it is easy to commit this error, it is often difficult to call to mind the precise word best adapted to express the particular thought. The following sentences illustrate the value of synonymous words:—

1. He was an *accomplished* speaker, *accomplished* in manners, *accomplished* in speech, *accomplished* in debate, and *accomplished* in his choice of words.

He was an *accomplished* speaker, *polished* in manners, *faultless* in speech, *skilful* in debate, and *eloquent* in his choice of words.

2. A diligent scholar may *acquire* knowledge, *acquire* celebrity, *acquire* rewards, *acquire* prizes, and *acquire* high honor, though he *acquire* no money.

A diligent scholar may *acquire* knowledge, *gain* celebrity, *obtain* rewards, *win* prizes, *get* high honor, though *earn* no money.

3. How strangely are the opinions of men *changed* by a *change* in their condition!

How strangely are the opinions of men *altered* by a *change* in their condition!