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Obama passes Clinton in poll

■ McCain doesn't lead either Democrat in head-to-head survey.

SUSAN PAGE
USA TODAY

WASHINGTON — Democratic presidential hopeful Barack Obama has edged ahead of Hillary Rodham Clinton for the first time in a nationwide *USA Today*/Gallup Poll, which also shows Republican John McCain struggling to energize a dispirited GOP.

A different poll shows Clinton still ahead of Obama, however.

The surveys were released on the eve of primaries today in Virginia, Maryland and the District of Columbia. In both polls, McCain is running statistically even in a head-to-head contest against Clinton and slightly behind Obama.

In the *USA Today* poll, Obama bests Clinton 47 to 44 percent among Democrats and independents who lean Democratic.

On the trail Notes from the campaign, **4A**

Among Republicans, McCain leads Mike Huckabee 53 to 27 percent among Republicans and independents who lean Republican. The poll of 1,016 adults has a margin of error of plus or minus 3 percentage points for the full sample and plus or minus 5 points for the Republican and Democratic subsamples.

The other poll released Monday, by the Associated Press-Ipsos, differed, showing Clinton leading Obama in the race for the Democratic nomination, 46 to 41 percent.

The AP-Ipsos survey of 1,029 adults was done Feb. 7-10. It had an overall margin of error of plus or minus 3.1 percentage points. ❑

Includes reporting by The Associated Press.

Read this article
and discuss it ...

② What could lead to a scientific controversy?

③ Can you think of instances where the outcome of a scientific controversy might affect your life?

④ Sammy the Weazel drives across town to visit his parole officer. Sammy is frustrated by the stop and go traffic. Sammy travels 12 kilometers in 30 minutes.

What is Sammy's "average speed" during the trip?

How does Sammy's average speed compare to his "instantaneous speed" at different points along his trip?

⑤ Late at night, is it possible to drive your car around the inner loop at a constant speed?

Is it possible to drive your car around the inner loop at a constant velocity?

⑥ Biff Johnson drives his sports car along a straight, level road at a constant speed. What is Biff's acceleration?

⑦ If Biff increases his speed from 10 M/s to 20 M/s in 100 seconds, what is Biff's acceleration? ($M/s \equiv$ meters per second)

⑧ If Biff decreases his speed from 20 M/s to 10 M/s in 100 seconds, what is Biff's acceleration?

⑨
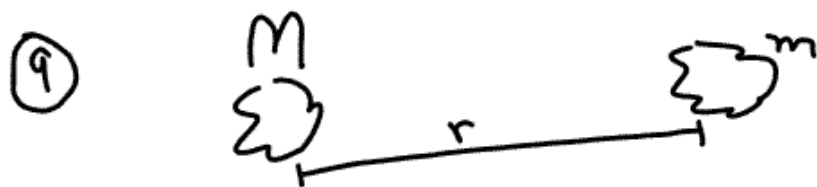
The gravitational force of attraction between two objects with mass M and m, respectively, separated by distance r is

$$F = \frac{GMm}{r^2}$$

= Mass of M   in kg (kilograms)

= Mass of m   in kg

G = a constant that characterizes the strength
of the gravitational force.

$$G = 6.67 \times 10^{-11} \frac{N \, m^2}{kg^2}$$

r = distance between centers of objects in m

If object $M = M_E$ is the earth and the other
object is near earth's surface

Earth

this
becomes

$$F_{on \, m} = \frac{G M_E m}{R_E^2}$$

$M = M_E$ = Mass of Earth = 5.97×10^{24} kg

m = mass of object in kg

R_E = Radius of Earth = 6.38×10^6 m

$$F = \boxed{\frac{G M_E m}{R_E^2}} = g \, m$$

Force → $F = ma$ always

Mass   acceleration

↳ from Newton's
second law as we
will see

Constant called g, units of acceleration (M/s^2)

g represents the acceleration of objects toward the center of the earth due to the gravitational force.

Your recitation leader will supply you with a photograph of a ball falling near the surface of the earth. In this photograph the flash emits light (strobes) every $\frac{1}{30}$ second. So images of the ball are recorded on the same frame every $\frac{1}{30}$ second as the ball falls.
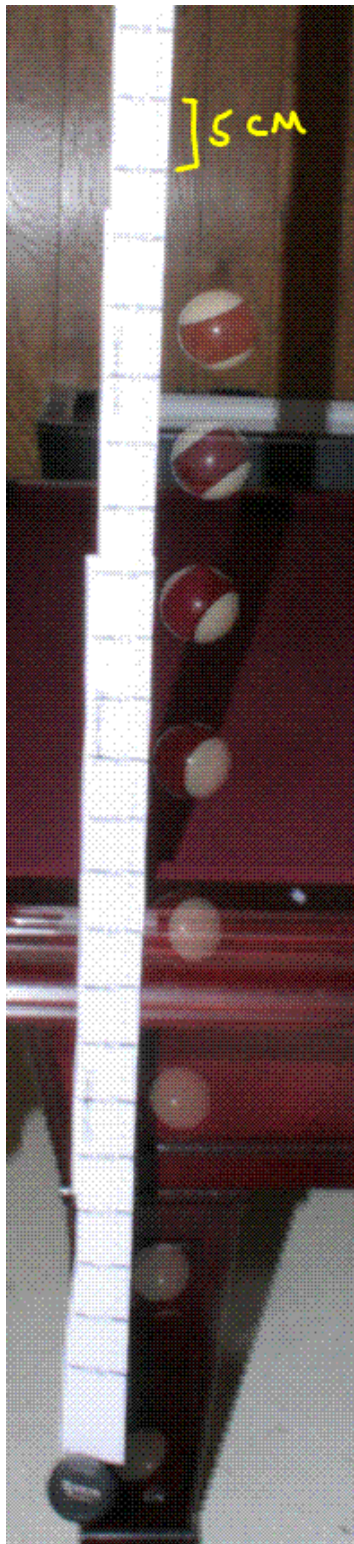
Discuss how you might use this photograph to measure g.

Measure g using the photograph

How "good" is your measurement? That is

Estimate the uncertainty in your measurement.

How does your value compare to the textbook value of $9.8 \, m/s^2$?

]5 cm

Flash strobe
    at 30 Hz

(1 flash every $\frac{1}{30}$ s)

5 cm spacing between
    dark lines