

# GSEE/Kyoto

The Global Partnership on Science Education through Engagement in Kyoto



Active and Experience-based Learning  
Office of Community Relations,  
Graduate School of Science,  
TSUNEMI Toshinao

Visiting elementary schools  
to encourage to get better  
community relations



number: 28

In Kyoto prefecture

We have 12 booths on science  
at each school

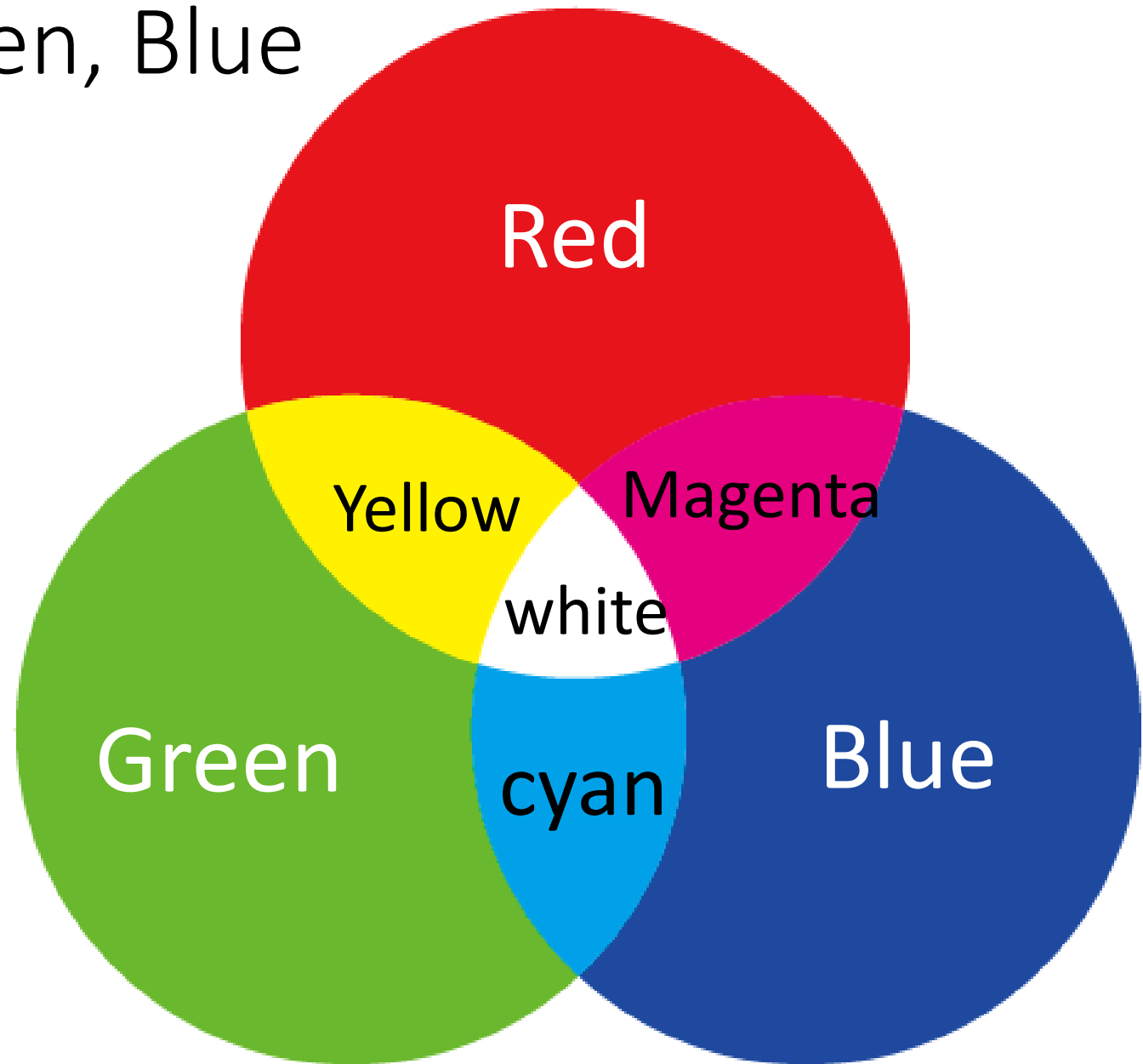
Message:

*Distance, is divided by time,*

*that is the problem:*

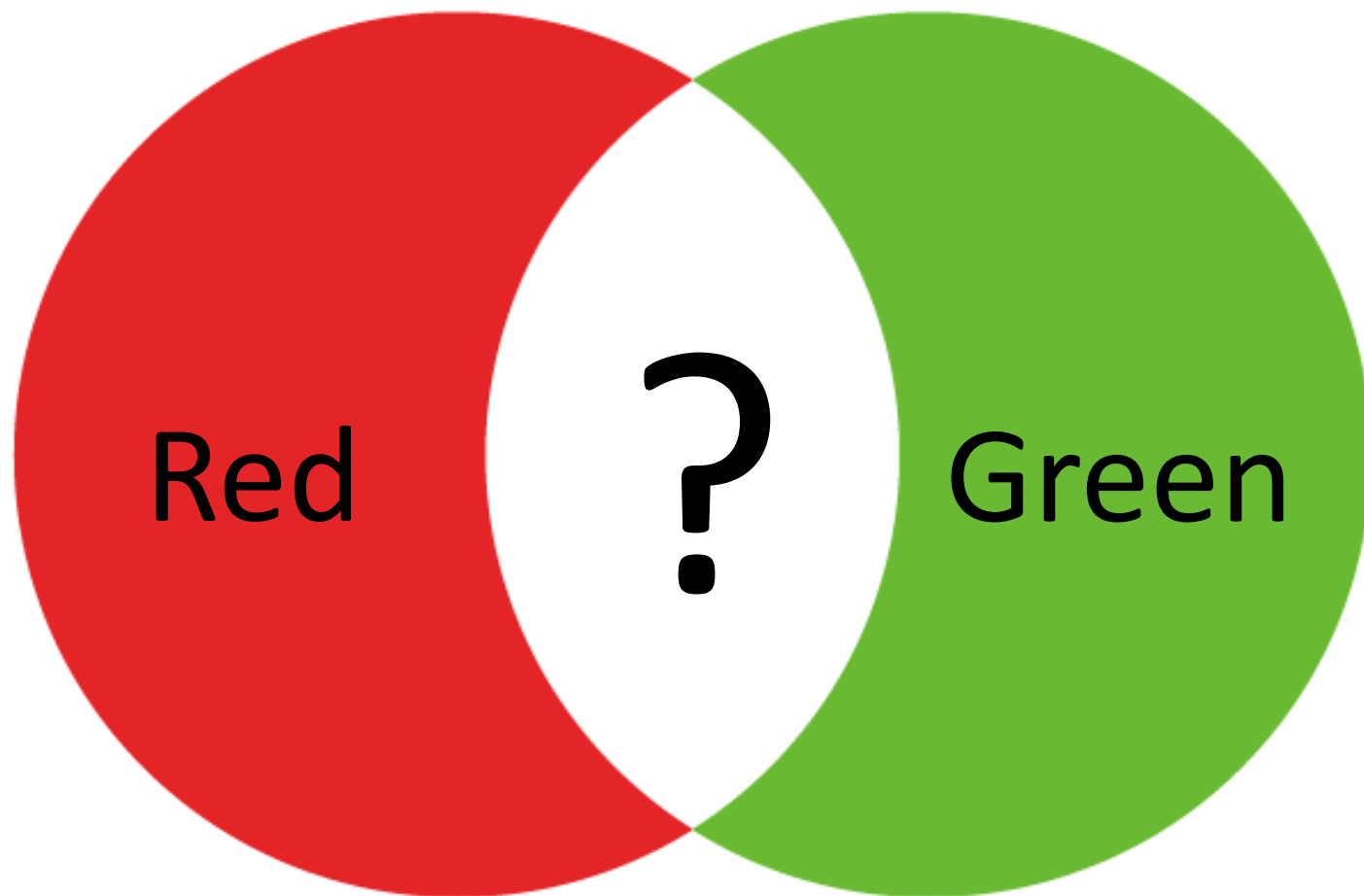
# Phenomenon

light's three primary colors  
Red, Green, Blue



# Questions

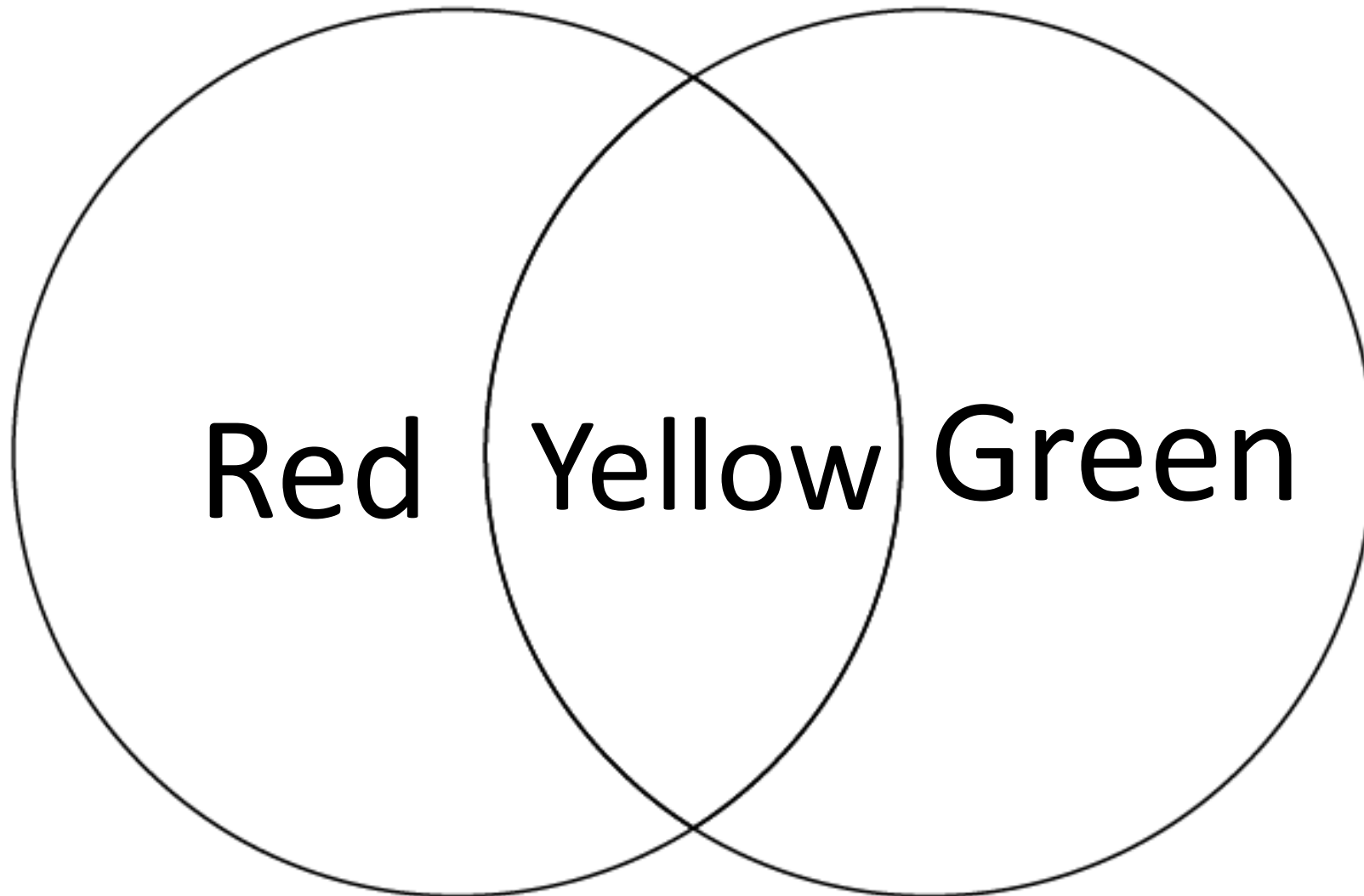
Red and Green makes:

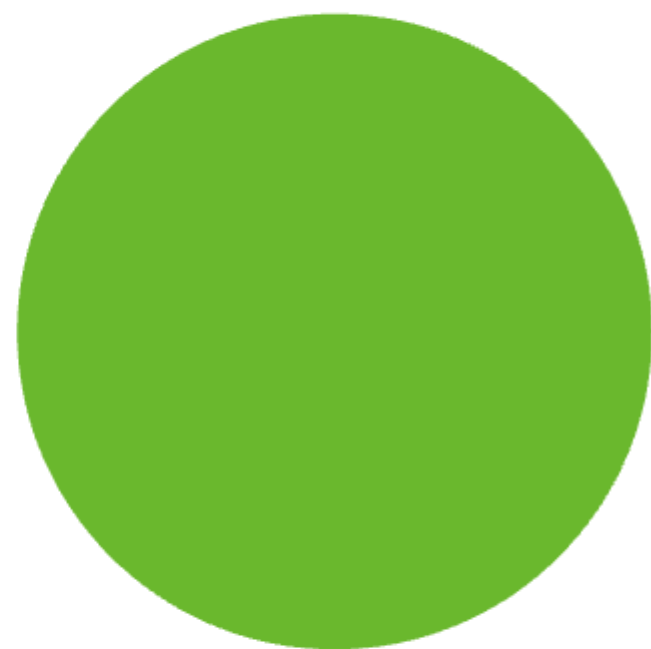
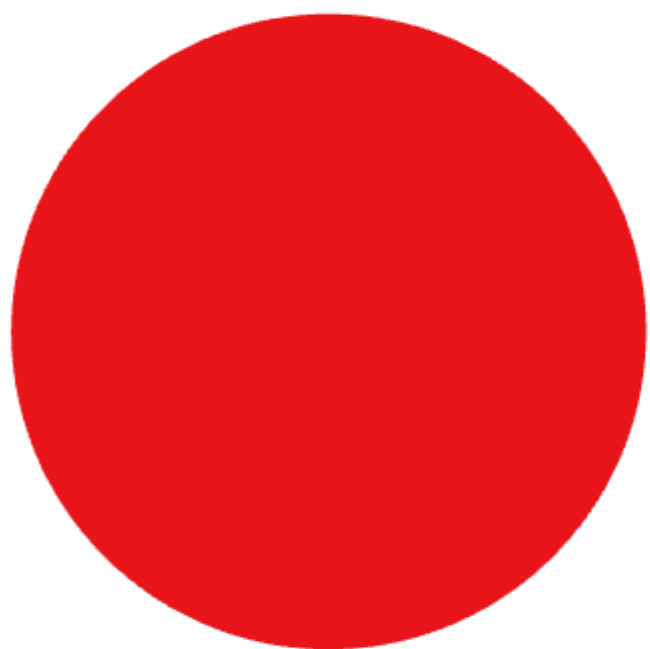


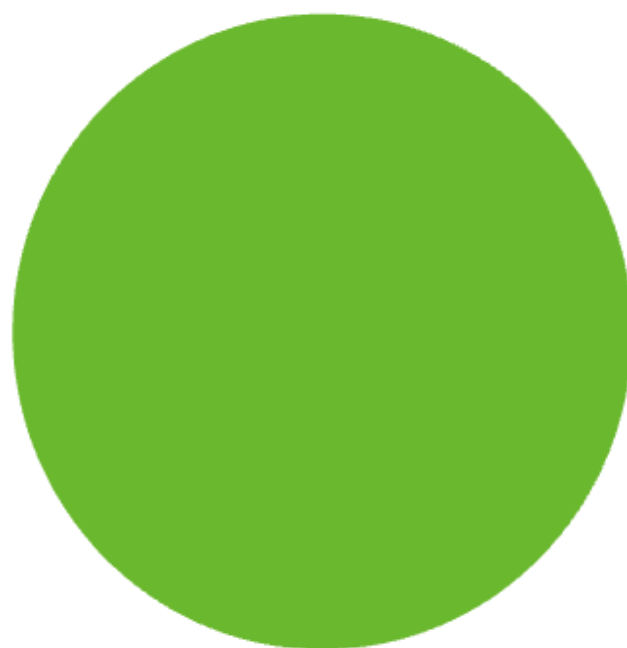
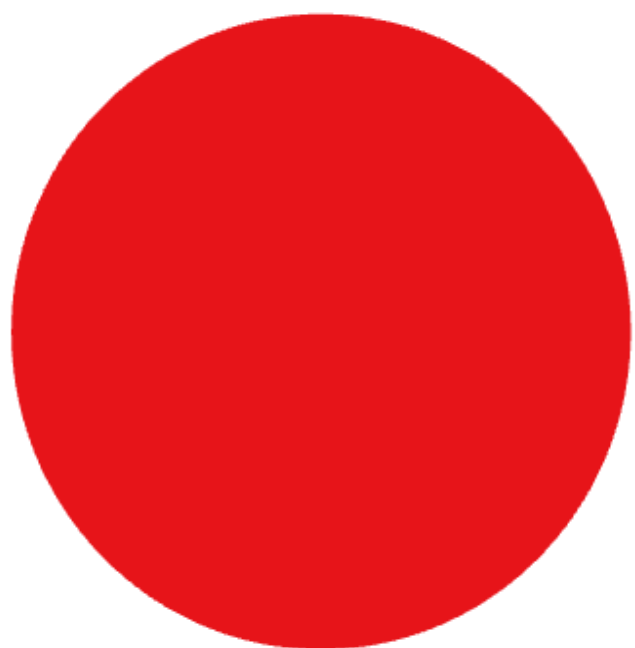
# Imagine the color

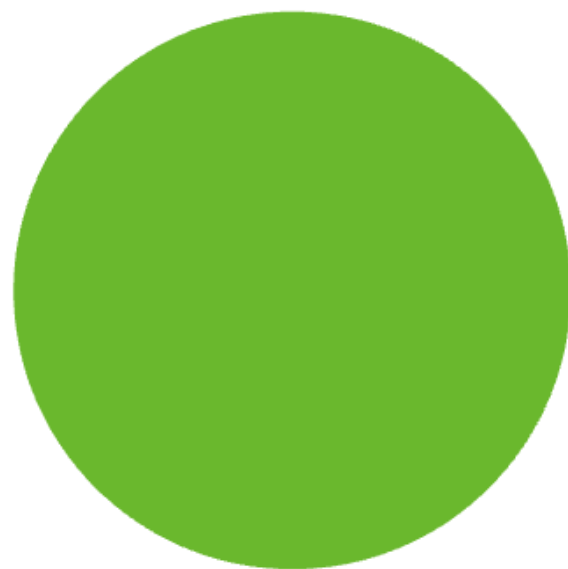
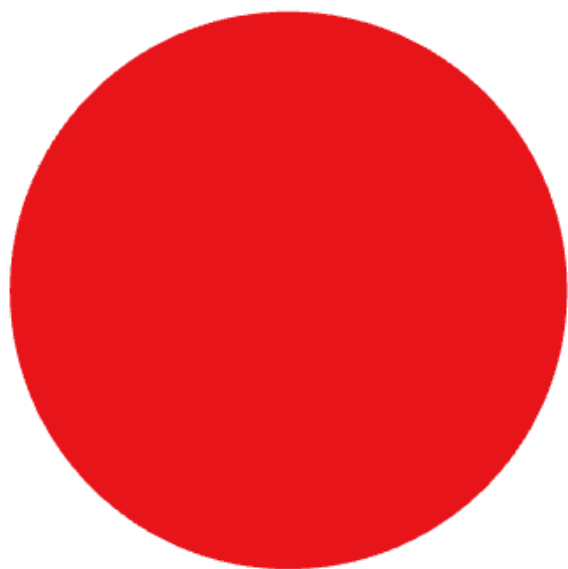
“Red and Green make Yellow”

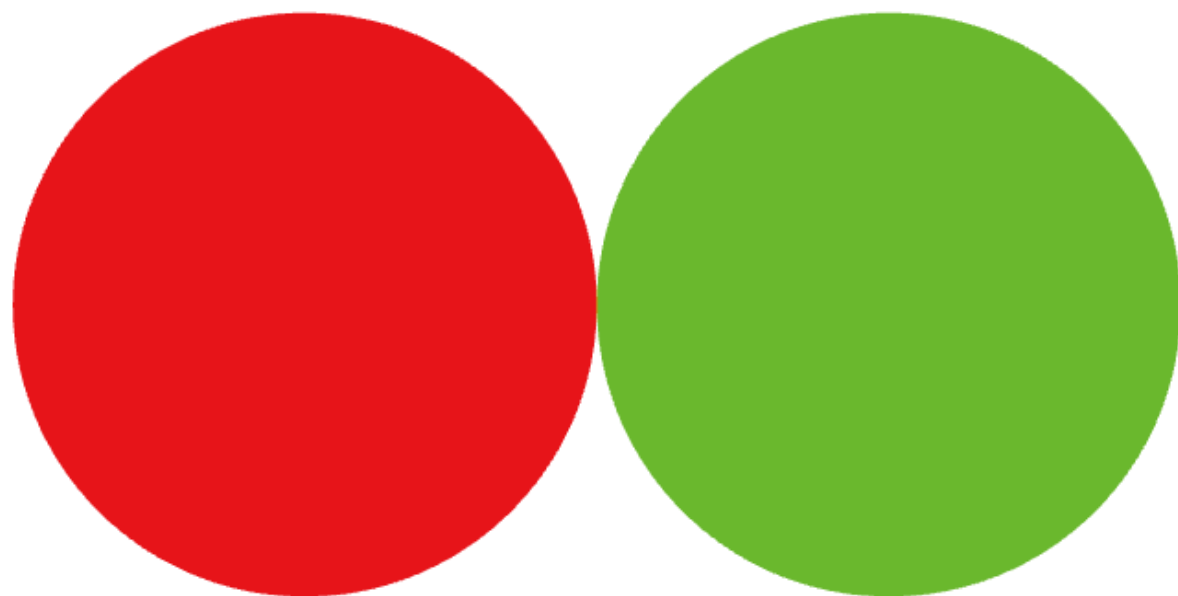
“Red and Green make Yellow”

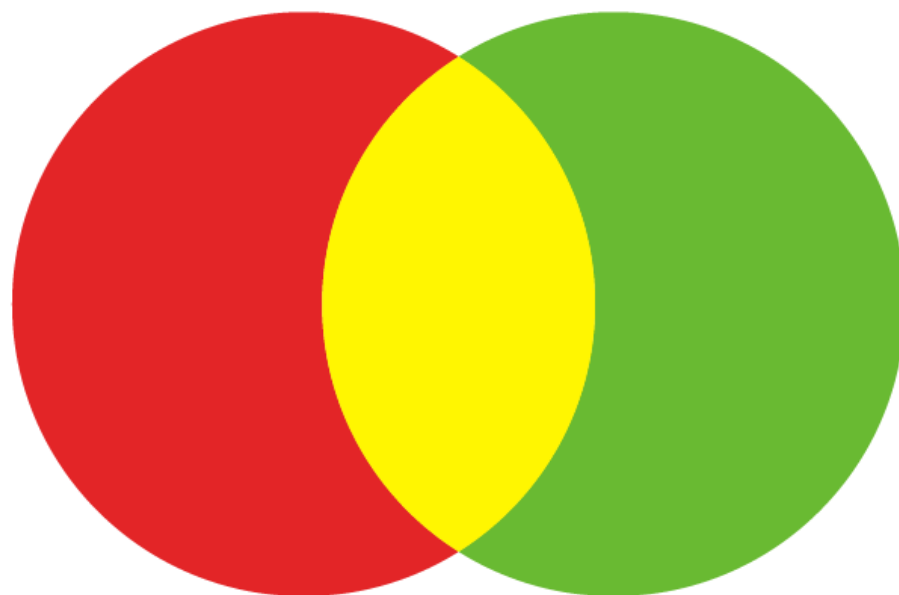




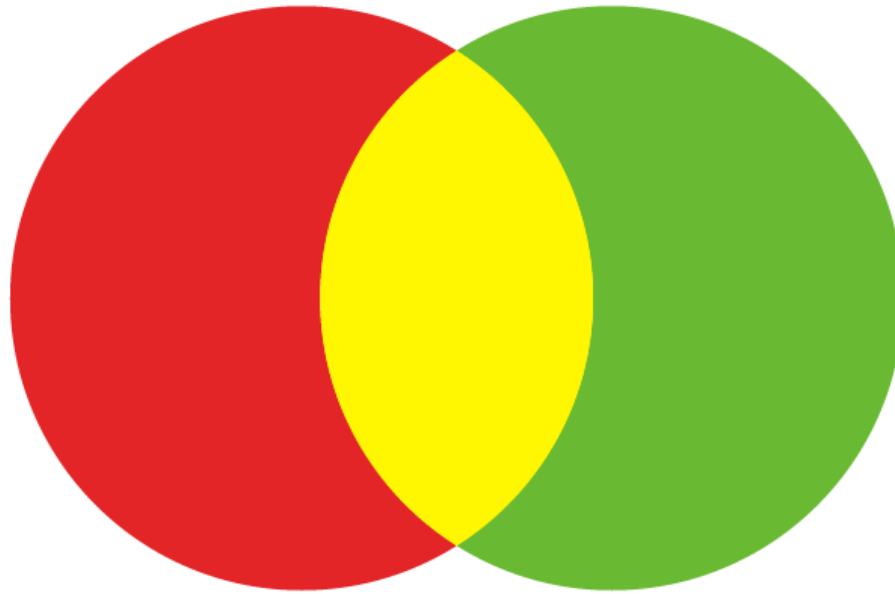




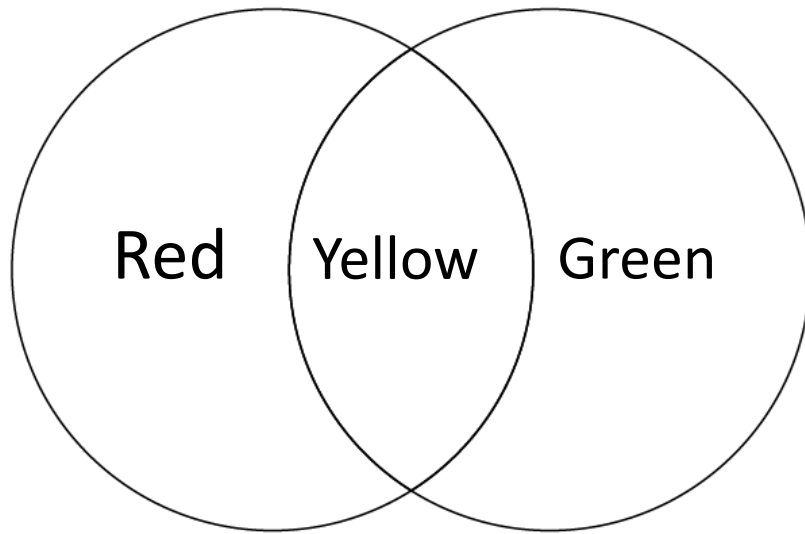




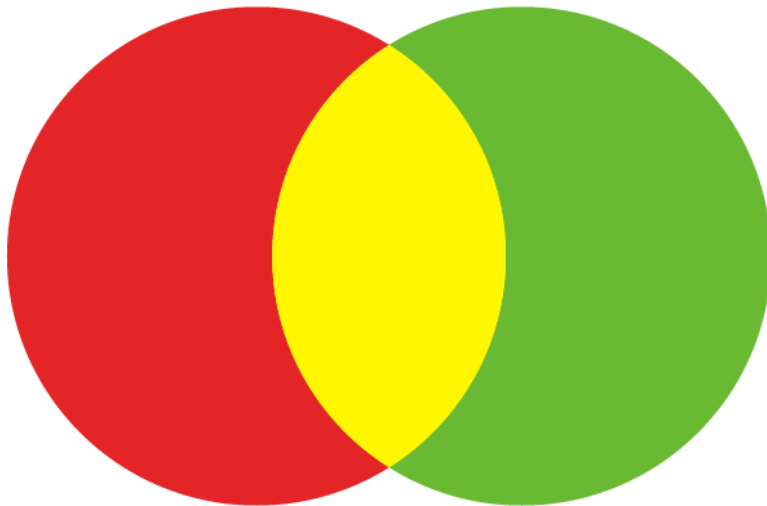
# Visual expression



Compare:



verbal



visual

Distance, is divided by time,  
that is the Speed:

Students are told to memorize by rote the phrase,  
as the phrase of hamlet by Shakespeare

“To be, or not to be , that is the question”

Message:

*Distance, is divided by time,*

*that is the problem:*

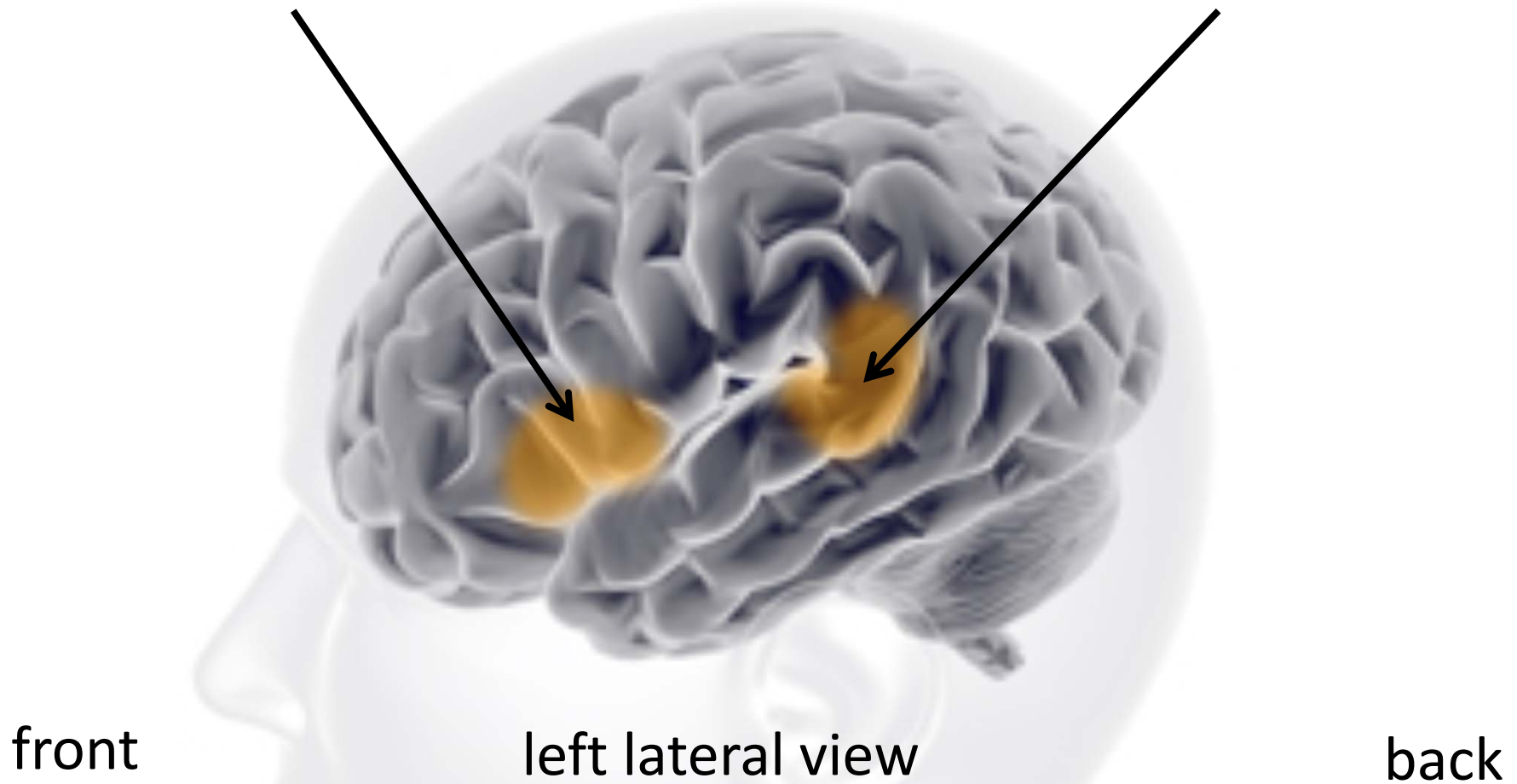
Reason

- Active area of a brain dealing with **arithmetical** expression is different from the activity of the brain dealing with **words**.

# WORDS:

Broca's area  
(motor speech center)

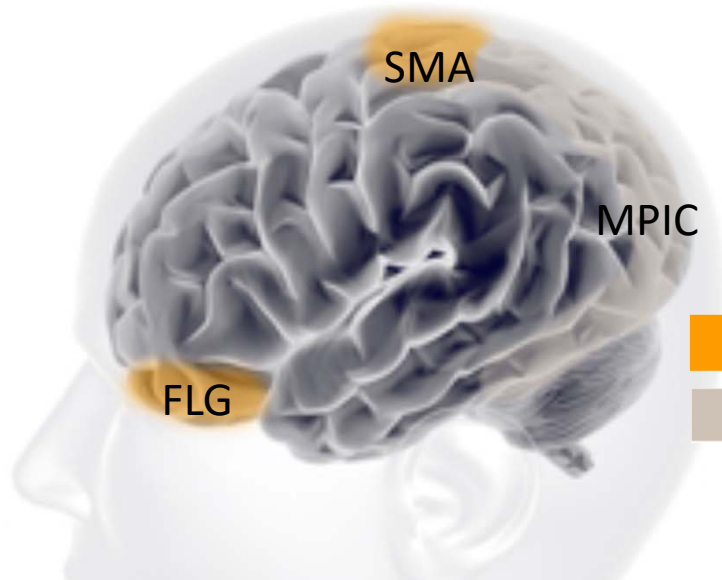
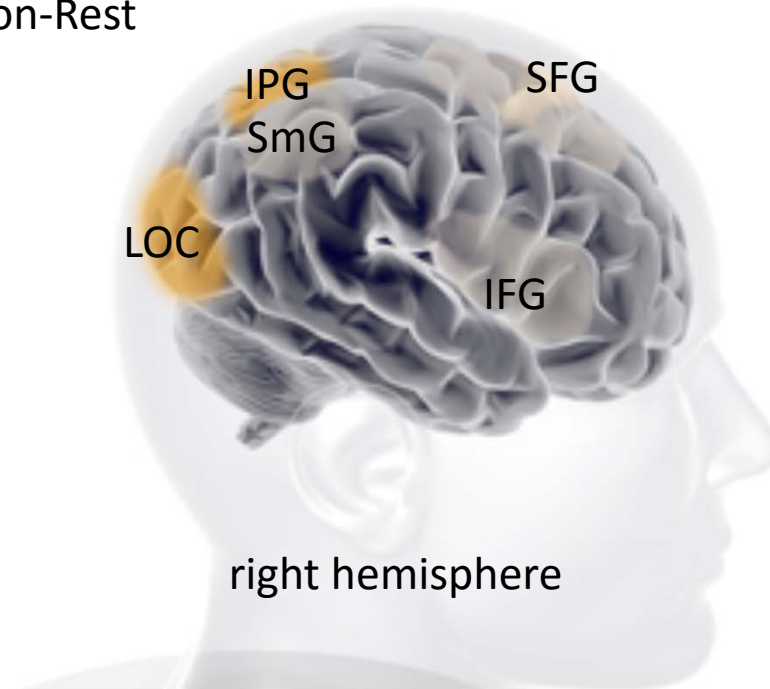
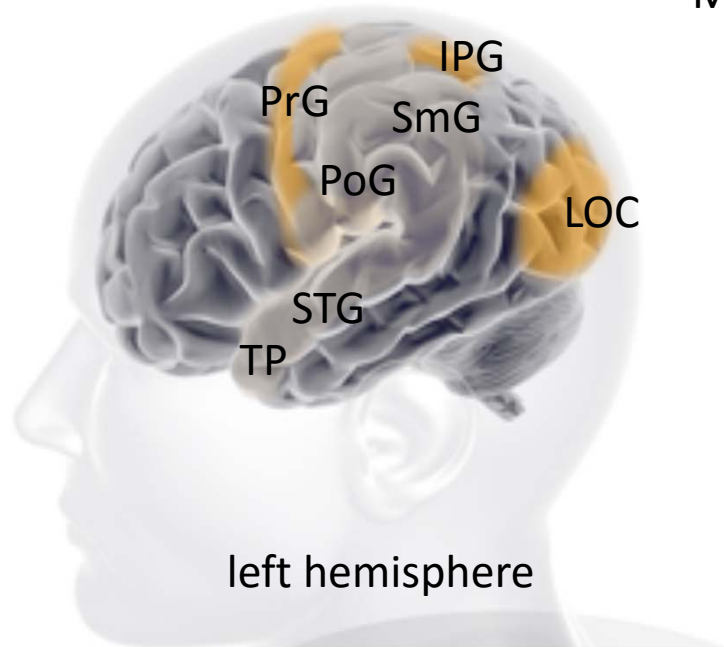
Wernicke's area  
(sensory speech center)





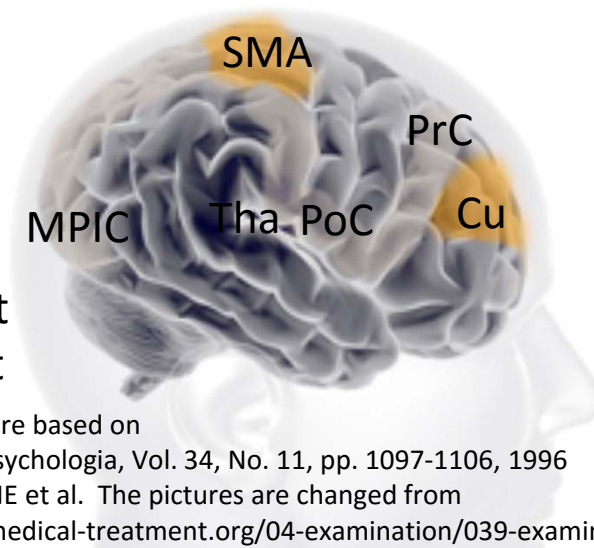
The image is changed from  
<http://medical-treatment.org/04-examination/039-examination.html>

# Arithmetic:

## Multiplication-Rest



 Multiplication > rest  
 Multiplication < rest



These are based on  
Neuropsychologia, Vol. 34, No. 11, pp. 1097-1106, 1996  
DEHAENE et al. The pictures are changed from  
<http://medical-treatment.org/04-examination/039-examination.html>

# Summary(message)

- An Experience-based Learning is important, because we have the visual and/or arithmetic world, which is different from verbalizable world.

- Evidence

Human Brain creates the world. The activity of the brain dealing with arithmetical expression is different from the activity of the brain dealing with words.

- Proposal

Educators identify both verbalizable and non-verbalizable world, and communicate them to children.

- conduct

We will continue to visit elementary schools.