Think Like a Citizen Scientist Pt. 1

Observation Quote Cards

For As Everyone Arrives: Create an Observation Tip Sheet

Prepare Ahead Steps:

1. Before the meeting, cut this sheet of paper along the dotted lines to create a set of 11 Observation Quote cards.
2. Optional: Paste or tape each card onto an index card for strength.
3. Create a set of cards for each pair or group of 3-4 girls.

"I am among those who think that science has great beauty. A scientist in his laboratory is not only a technician: he is also a child placed before natural phenomena which impress him like a fairy tale. We should not allow it to be believed that all scientific progress can be reduced to mechanisms, machines, gearings, even though such machinery also has its beauty."

—**Marie Curie**, the first woman to win a Nobel Prize, the only woman in history to ever win it twice, and the only human to ever win a Nobel Prize in two different sciences

"Observe, record, tabulate, communicate. Use your five senses. Learn to see, learn to hear, learn to feel, learn to smell, and know that by practice alone you can become expert."

—**William Osler,** a Canadian physician and one of the founding professors of Johns Hopkins University

"If facts are the seeds that later produce knowledge and wisdom, then the emotions and the impressions of the senses are the fertile soil in which the seeds must grow."

—**Rachel Carson,** an American marine biologist, conservationist and author of books including *Silent Spring*

"We cannot create observers by saying 'observe', but by giving them the power and the means for this observation and these means are procured through education of the senses."

—**Dr. Maria Montessori,** an Italian physician and educator known for her method for teaching

"Science, for me, gives a partial explanation for life. In so far as it goes, it is based on fact, experience and experiment."

—**Rosalind Franklin,** a British chemist, molecular biologist, and one of the key figures behind unlocking the structure of human DNA

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"There are three principal means of acquiring knowledge... observation of nature, reflection, and experimentation. Observation collects facts; reflection combines them; experimentation verifies the result of that combination."

—**Denis Diderot,** a French philosopher during the Enlightenment

"Observe always that everything is the result of change, and get used to thinking that there is nothing Nature loves so well as to change existing forms and make new ones like them."

—*Meditations* by **Marcus Aurelius**, Roman Emperor and philosopher

"In the field of observation, chance favors only the prepared mind."

—**Louis Pasteur,** a French biologist known for his research on vaccines and disease prevention

"Knowledge comes from noticing resemblances and recurrences in the events that happen around us."

—**Wilfred Trotter,** a British surgeon and pioneer of neuroscience and social psychology

"Scientific method, although in its more refined forms it may seem complicated, is in essence remarkably simply. It consists in observing such facts as will enable the observer to discover general laws governing facts of the kind in question. The two stages, first of observation, and second of inference to a law, are both essential, and each is susceptible of almost indefinite refinement."

—**Bertrand Russell,** a British philosopher, mathematician, and activist during the turn of the 20th century

"The long hours spent with them in the forest have enriched my life beyond measure. What I have learned from them has shaped my understanding of human behavior, of our place in nature."

—**Jane Goodall,** scientist, author, and environmental activist on her research work with chimpanzees