

# BEST QUOTES ON RESEARCH

Somewhere something incredible is waiting to be known.

--Carl Sagan

The deepest sin against the human mind is to believe things without evidence.

--Thomas Henry Huxley

To mistrust science and deny the validity of the scientific method is to resign your job as a human. You'd better go look for work as a plant or wild animal.

--P. J. O'Rourke

Hell, there are no rules here—we're trying to accomplish something.

--Thomas Alva Edison

It is the lone worker who makes the first advance in a subject: the details may be worked out by a team, but the prime idea is due to the enterprise, thought and perception of an individual.

--Sir Alexander Fleming

In God we trust; all others bring data.

—W. Edwards Deming

The important thing is not to stop questioning.

--Albert Einstein

Nightingale [Florence]...analyzed army mortality rates. [She] uncovered a stunning fact: Most of the soldiers in the Crimean War hadn't died in combat. They'd died of 'preventable diseases'—precisely the sort caused by terrible hygiene. Clean up the hygiene and you'd save lives. Nightingale adroitly realized that tables of numbers and text would be too hard to parse. They needed, she said, a data visualization—'to affect thro' the eyes what we fail to convey to the public through their word-proof ears.' Her invention was the elegant 'polar area chart,' a new variant of the pie chart: Each slice of the pie showed deaths for one month of the war, growing larger if the deaths increased, and color-coded to show the causes of death. Fans called it the 'rose diagram,' because it looked like a flower.

—Clive Thompson

Intelligent ignorance is the first requirement in research.

--Charles F. Kettering

Research is to see what everybody else has seen, and to think what nobody else has thought.

—Albert Szent-Gyorgyi

I do research because I enjoy the thrill of discovery. The work is collecting data. The fun is analyzing the data for new patterns.

--Nola Pender

I never did anything worth doing by accident, nor did any of my inventions come by accident; they came by work.

--Thomas Edison

I remember the rage I used to feel when a prediction went awry. I could have shouted at the subjects of my experiments, 'Behave, damn you, behave as you ought!' Eventually I realized that the subjects were always right. It was I who was wrong. I had made a bad prediction.

--Burrhus Frederic  
Skinner

Results! Why, man, I have gotten a lot of results. I know several thousand things that won't work.

--Thomas A. Edison

The riddle does not exist. If a question can be put at all, then it can also be answered.

--Ludwig Wittgenstein

I have learned to use the word impossible with the greatest caution.

--Wernher von Braun

Measure what is measurable, and make measurable what is not so.

--Galileo Galilei

When you make the finding yourself--even if you are the last person on Earth to see the light--you will never forget it.

—Carl Sagan

Research can send me down the rabbit hole, and, like Alice, I might not come up for air for hours as I wander and ponder and fill my basket with the historical jewels I want to use.

—Beverly Jenkins

Research scientists may be the only people in the world who are considered to be doing something useful when they don't know what they're doing.

--Unknown

When confronted with the fact that he had not memorized the Periodic Table of Elements, Einstein replied, 'I never memorize anything I can look up!'

--Albert Einstein

Nothing saddens me so much as witnessing brilliant young intellects addressing enormous efforts to trivial problems.

--Solomon Snyder

If I have seen further than others, it is by standing on the shoulders of giants.

--Isaac Newton

Ninety percent of the historical researcher's time is spent at the intellectual level of collecting postage stamps.

--Lawrence Stone

Research teaches a man to admit he is wrong and to be proud of the fact that he does so, rather than try with all his energy to defend an unsound plan because he is afraid that admission of error is a confession of weakness when rather it is a sign of strength.

--Prof. H. E. Stocher

A couple of months in the laboratory can frequently save a couple of hours in the library.

--Frank Westheimer

We only trust what we can measure.

--Unknown

Basic research is what I am doing when I don't know what I am doing.

--Wernher von Braun

It often happens that an unsuccessful experiment may produce an excellent observation. There are, therefore, no unsuccessful experiments.

--Claude Bernard

And from the discontent of man  
The world's best progress springs.

--Ella Wheeler Wilcox

It is wiser, I believe to arrive at theory by way of evidence rather than the other way round....It is more rewarding, in any case, to assemble the facts first and, in the process of arranging them in narrative form, to discover a theory or a historical generalization emerging on its own accord.

--Barbara Tuchman

The intensity of a conviction that a hypothesis is true has no bearing on whether it is true.

--Peter Medawar

The outcome of any serious research can only be to make two questions grow where only one grew before.

--Thorstein Veblen

The civilized man has a moral obligation to be skeptical, to demand the credentials of all statements that claim to be facts.

--Bergen Evans

It is a capital mistake to theorize before one has data.

--Sir Arthur Conan Doyle

People in general have no notion of the sort and amount of evidence often needed to prove the simplest matter of fact.

--Peter Mere Latham

In completing one discovery we never fail to get an imperfect knowledge of others of which we could have no idea before, so that we cannot solve one doubt without creating several new ones.

--Joseph Priestley

You don't have to see all the grains of sand to recognize a beach.

--Unknown

All things are possible until they are proved impossible—and even the impossible may only be so, as of now.

--Pearl S. Buck

Research is the process of going up alleys to see if they're blind.

--Marston Bates

When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong.

--Arthur C. Clarke

Ideas won't keep. Something must be done about them. The idea must constantly be seen in some new aspect. Some element of novelty must be brought into it freshly from time to time; and when that stops, it dies. The meaning of life is adventure.

--Alfred North Whitehead

I have heard a student censured for working out his own idea before learning all that others had done on the subject. But he was right; one may know too much, especially at first. The time for exhaustive reading is when you have worked out your own ideas with some fullness and in a spirit of discovery.

--Charles Horton  
Cooleyre

It is often wonderful how putting down on paper a clear statement of a case helps one to see, not perhaps the way out, but the way in.

--A. C. Benson

I have steadily endeavored to keep my mind free so as to give up any hypothesis, however much beloved (and I cannot resist forming one on every subject), as soon as the facts are shown to be opposed to it.

--Charles Darwin

In science the credit goes to the man who convinces the world, not to the man to whom the idea first occurs.

--William Osler

The eyes believe themselves; the ears believe other people.

--German Proverb

Sit down before fact as a little child, be prepared to give up every preconceived notion, follow humbly wherever and to whatever abyss nature leads, or you shall learn nothing.

--Thomas Huxley

The message from the moon...is that no problem need any longer be considered insoluble.

--Norman Cousins

The next best thing to knowing something is knowing where to find it.

—Dr. Samuel Johnson

A man will turn over half a library to make one book.

--Samuel Johnson

I do not know what I may appear to the world; but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me.

--Sir Isaac Newton

Name the greatest of all the inventors. Accident.

--Mark Twain

If you copy anything out of one book, it is plagiarism. If you copy it out of two books, it is research. If you copy it out of six books, you are a professor.

--Fulton J. Sheen

Research is of great importance to a profession...while certain kinds of problems can be solved only by highly trained research specialists, other problems of equal importance can be solved only as teachers, supervisors, and principals become researchers.

--*Teachers Newsletter*

Research, to some so-called investigators, is like fashion. They follow the popular fields, and shift as the fashion changes. A leader starts a new line of study; all the so-called researchers quickly follow. Fortunately, their number is small. We do not need many researchers; what we need today are searchers.

--Louis N. Katz

Research is like saving. If postponed until needed, it is too late.

--Unknown

One measure of the maturity of a science is the extent to which problems for investigation have been identified. The greater the volume of research in a field the more extensive are the new areas identified for investigation.

--Carter V. Good

You should use statistics as a drunk uses a lamp post—for support rather than illumination.

--*Schoolmaster*

I suppose every scholar has had the experience of reading something in a book which was significant to him, but which he could never find again. Sure he is that he read it there; but no one else ever read it, nor can he find it again.

--Ralph Waldo Emerson

Every man has a right to his opinion, but no man has a right to be wrong in his facts.

--Bernard M. Baruch

There are three kinds of lies: lies, damned lies, and statistics.

--Benjamin Disraeli

Do not put your faith in what statistics say until you have carefully considered what they do not say.

--William W. Watt

True genius resides in the capacity for evaluation of uncertain hazardous, and conflicting information.

--Winston Churchill

One of the greatest joys known to man is to take a flight into ignorance in search of knowledge.

--Robert Lynd

Every great advance in natural knowledge has involved the absolute rejection of authority.

--Thomas Huxley

The simplest questions are the hardest to answer.

--Northrop Frye

There are no facts, only interpretations.

--Friedrich Nietzsche

Statistics are no substitute for judgement.

--Henry Clay

Get your facts first, and then you can distort 'em as much as you please.

--Mark Twain

To believe with certainty we must begin with doubting.

--Stanislaus, King of  
Poland

Modest doubt is call'd  
The beacon of the wise.

--William Shakespeare

What is research, but a blind date with knowledge?

--Will Henry

The great tragedy of Science: the slaying of a beautiful hypothesis by an ugly fact.

--Thomas Huxley

No amount of experimentation can ever prove me right; a single experiment can prove me wrong.

--Albert Einstein

I think and think for months and years. Ninety-nine times, the conclusion is false. The hundredth time I am right.

--Albert Einstein

A nice old lady, well-bred and what is called well-educated, once remarked to me in passing that the giant waterbugs one often sees flying about street lights in southern cities were generated by the electric current, and when I expressed some skepticism concerning this novel theory of the origin of life she was ready with a proof. They had never been seen in her town until electricity was brought there.

--Joseph Wood Krutch



Discovery consists of seeing what everybody has seen and thinking what nobody has thought.

--Albert Szent-Gyorgyi

The seeds of great discoveries are constantly floating around, but they only take root in minds well prepared to receive them.

--Joseph Henry

I dream up all sorts of theories at night and then disprove them in the laboratory the next day. Checking a hunch, sometimes I see some discrepancy, something unexpected—then I follow it up. Success depends on whether the hunch was good or bad.

--Albert Szent-Gyorgyi

When you've filled yourself with a particular problem,...you have a great desire to have some clarity in it. You go through this long, hard period of filling yourself up with as much information as you can. You just sort of feel it all rumbling around inside of you, not particularly at a conscious level. Then...you begin to feel a solution, a resolution, bubbling up to your consciousness. At the same time you begin to get very excited, tremendously elated—pervaded by a fantastic sense of joy.

--Robert R. Wilson

No scientist can be continuously aware of...remote possible consequences of his labors; in fact the long goal is so remote that if he kept his eye on it he would become hopelessly discouraged over the half inch of progress his own life's work will represent. But it was the vision of this which first made him choose his curious career, and it is an emotional sense of the great structure of scientific knowledge to which his little grain will be added which drives him along.

--Oliver La Farge

In man's technological progress, therefore, it required tens of centuries to arrive at the idea of scientific planning and checking. Man made his latest great step forward when he said, 'Just what is it I want to do?' and then tested his results to see if he had attained his object. In this way he discovered that planning could unlock the previously unknown.

--Ruth Benedict

Statistics is the art of lying by means of figures.

--Dr. Wilhelm Stekhel

There is one thing even more vital to science than intelligent methods; and that is, the sincere desire to find out the truth, whatever it may be.

--Charles Sanders Pierce

That is the worst of erudition—that the next scholar sucks the few drops of honey that you have accumulated, sets right your blunders, and you are superseded.

--A. C. Benson

I cannot discover that anyone knows enough to say definitely what is and what is not possible.

--Henry Ford

To give birth to an idea—to discover a great thought—an intellectual nugget, right under the dust of a field that many a brain-plow had gone over before....

--Mark Twain

There is always money for, there are always doctorates in, the learned foolery of research into what, for scholars, is the all-important problem: Who influenced whom to say what when? Even in this age of technology the verbal humanities are honored. The non-verbal humanities, the arts of being directly aware of the given facts of our existence, are almost completely ignored.

--Aldous Huxley

There is always more chance of hitting upon something valuable when you aren't too sure what you want to hit upon.

--Alfred North Whitehead

The trouble with facts is that there are so many of them.

--Samuel McChord  
Crothers

One of the most untruthful things possible, you know, is a collection of facts, because they can be made to appear so many different ways.

--Dr. Karl Menninger

I believe in general in a dualism between facts and the ideas of those facts in human heads.

--George Santayana

If a man will take his place before almost any fact and scrounge down into it, he will come upon something not adequately known.

--Charles Horton Cooley

To treat your facts with imagination is one thing, to imagine your facts is another.

--John Burroughs

Facts are carpet-tacks under the pneumatic tires of theory.

--Austin O'Malley

Let us take things as we find them: let us not attempt to distort them into what they are not. True philosophy deals with facts. We cannot make facts. All our wishing cannot change them. We must use them.

--John Henry Cardinal  
Newman

In the spider-web of facts, many a truth is strangled.

--Paul Eldridge

Mix a conviction with a man and something happens.

--Adam Clayton Powell

In pure research, knowledge is sought for its own sake and not because it has an application. We want to know more. Pure research is valuable because one cannot be terribly certain what knowledge that is without application today may have an application in the future.

--Jerrold Zar

Research is 50 percent frustration, 45 percent slave labor, 5 percent success—and oh, how sweet it is.

--Patricia Vary

A teacher who is alive and interesting is involved in knowledge generation. Research is a part of being a university scholar.

--Nola Pender

An important aspect of research is sharing of knowledge. Dissemination is important for two reasons. The academic mentality is one of free inquiry. We don't want to keep knowledge a secret, we want others to benefit by it. Knowledge also needs to be shared so that it can be judged, so that it can be evaluated by others.

--Jerrold Zar

In basic research, you're curious, you see a phenomenon, and you want to know why it's there. You want to expand knowledge in some form. You see a wall and you chip away at it. Lots of people can work a long time on basic research without obvious conclusions emerging. But, if a lot of people keep chipping away, the wall will finally be broken down. In applied research, you have a specific goal in mind, a problem that needs to be solved, and you work toward solving that problem.

--Patricia Vary

The role of a research university is to create knowledge as well as to transmit it through teaching.

--Elizabeth E. Bass

There are one-story intellects, two-story intellects, and three-story intellects with skylights. All fact collectors who have no aim beyond their facts are one-story men. Two-story men compare, reason, generalize, using the labor of fact collectors as their own. Three-story men idealize, imagine, predict—their best illumination comes from above the skylight.

--Oliver Wendell Holmes

It is truth very certain that, when it is not in one's power to determine what is true, we ought to follow what is more probable.

--Rene Descartes

Our minds are finite, and even in these circumstances of finitude we are surrounded by possibilities that are infinite; and the purpose of human life is to grasp as much as we can out of that infinitude.

--Alfred North Whitehead

To those who are alive, every action, every thought, is in the nature of an experiment. Thought and deed go hand in hand, the twin instruments of those who recognize that a great deal more of life has yet to be revealed to man than the most visionary of men have yet imagined. We have, as yet, only touched the veriest hem of life's garment.

--Holbrook Jackson

By a small sample we may judge of the whole piece.

--Miguel de Cervantes

Some circumstantial evidence is very strange as when you find a trout in the milk.

--Henry David Thoreau

The grand Aim of all Science is to cover the greatest number of empirical facts by logical deduction from the smallest number of hypotheses or axioms.

--Albert Einstein

A wise man recognizes the convenience of a general statement, but he bows to the authority of a particular fact.

--Oliver Wendell  
Holmes, Sr.

A fact is like a sack which won't stand up when it is empty. In order that it may stand up, one has to put into it the reason and sentiment which have caused it to Exist.

--Luigi Pirandello

When you have duly arrayed your 'facts' in logical order, lo, it is like an oil-lamp that you have made, filled and trimmed, but which sheds no light unless first you light it.

--Saint-Exupery

It is the spirit of the age to believe that any fact, no matter how suspect, is superior to any imaginative exercise, no matter how true.

--Gore Vidal

He who asks questions cannot avoid the answers.

--Cameroonian Proverb

I know of no inquiry which the impulses of man suggests that is forbidden to the resolution of man to pursue.

--Margaret Fuller

It is by losing himself in the objective, in inquiry, creation, and craft, that a man becomes something.

--Paul Goodman

It is common sense to take a method and try it. If it fails, admit it frankly and try another. But above all, try something.

--Franklin D. Roosevelt

God give me strength to face a fact though it slay me.

--Thomas H. Huxley

Approach each new problem not with a view of finding what you hope will be there, but to get the truth, the realities that must be grappled with. You may not like what you find. In that case you are entitled to try to change it. But do not deceive yourself as to what you do find to be the facts of the situation.

--Bernard M. Baruch

Accustom yourself to the roughest and simplest scientific tools. Perfect as the wing of a bird may be, it will never enable the bird to fly if unsupported by the air. Facts are the air of science. Without them a man of science can never rise. Without them your theories are vain surmises. But while you are studying, observing, experimenting, do not remain content with the surface of things. Do not become a mere recorder of facts, but try to penetrate the mystery of their origin. Seek obstinately for the laws that govern them.

--Ivan Pavlov

Remember that science claims a man's whole life. Had he two lives they would not suffice. Science demands an undivided allegiance from its followers. In your work and in your research there must always be passion.

--Ivan Pavlov

Statistics can be used to support anything—especially statisticians.

--Franklin P. Jones

Grey is the color of all theory.

--Johann Wolfgang von  
Goethe

Look, and you will find it—what is unsought will go undetected.

--Sophocles

Nothing is more shameful than assertion without knowledge.

--Cicero

Man alone can do the impossible.

--Johann Wolfgang von  
Goethe

This fire so scorches our brain, that we want to plunge deep into the gulf, whether heaven or hell, who cares? To find something new in the depths of the unknown!

--Charles Baudelaire

The spirit of innovation is capable of demolishing even the most solid of walls.  
--Michel Servin

It has been said that figures rule the world; maybe. I am quite sure that it is figures which show us whether it is being ruled well or badly.  
--Johann Wolfgang von Goethe

Errors, like straws, upon the surface flow;  
He who would search for pearls must dive below.  
--John Dryden

We can prove whatever we want to prove, and the real difficulty is to know what we want to prove.  
--Emile Auguste Chartier

Facts, when combined with ideas, constitute the greatest force in the world.  
--Carl W. Ackerman

Realists do not fear the results of their study.  
--Fyodor Mihayloviç Dostoyevski

The sky is not less blue because the blind man does not see it.  
--Danish Proverb

Statistics are like witnesses—they will testify for either side.  
--Ken Magid and Carole A. McKelvey

Every experiment is like a weapon which must be used in its particular way—a spear to thrust, a club to strike. Experimenting requires a man who knows when to thrust and when to strike, each according to need and fashion.  
--Philippus Aureolus Paracelsus

They are ill discoverers that think there is no land, when they can see nothing but sea.  
--Francis Bacon

The beginning of research is curiosity, its essence is discernment, and its goal truth and justice.

--Isaac H . Satanov

Do not become archivists of facts. Try to penetrate the secrets of their occurrence, persistently search for the laws which govern them.

--Ivan Pavlov

Scholars do not always read the scientific literature carefully. Science is not a perfectly objective process. Dogma and prejudice, when suitably garbled, creep into science just as easily as into any other human enterprise, and maybe more easily since their entry is unexpected.

--William Broad and  
Nicholas Wade

After all we could get on very happily if aviation, wireless, television and the like advanced no further than at present....The sum of human happiness would not necessarily be reduced if for ten years every physical and chemical laboratory were closed and the patient and resourceful energy displayed in them transferred to the lost art of getting on together and finding the formula for making both ends meet in the scale of human life. Much, of course, we should lose by this universal scientific holiday...but human happiness would not necessarily suffer.

--Edward Arthur  
Burroughs

There is only one proved method of assisting the advancement of pure science—that of picking men of genius, backing them heavily, and leaving them to direct themselves.

--James Bryant Conant

The stumbling way in which even the ablest of the scientists in every generation have had to fight through thickets of erroneous observations, misleading generalizations, inadequate formulations, and unconscious prejudice is rarely appreciated by those who obtain their scientific knowledge from textbooks.

--James Bryant Conant

The real scientist...is ready to bear privation and, if need be, starvation rather than let anyone dictate to him which direction his work must take.

--Albert Szent-Gyorgyi



Factual evidence can never 'prove' a hypothesis; it can only fail to disprove it, which is what we generally mean when we say, somewhat inexactly, that the hypothesis is 'confirmed' by experience.

--Milton Friedman

The construction of hypotheses is a creative act of inspiration, intuition, inventing its essence is the vision of something new in familiar material.

--Milton Friedman

The shrewd guess, the fertile hypothesis, the courageous leap to a tentative conclusion—these are the most valuable coin of the thinker at work.

--Jerome Seymour  
Bruner

The scientist values research by the size of its contribution to that huge, logically articulated structure of ideas which is already, though not yet half built, the most glorious accomplishment of mankind.

--Sir Peter Brian  
Medawar

It is a test of true theories not only to account for but to predict phenomena.

--William Whewell

Undoubtedly we have no questions to ask which are unanswerable. We must trust the perfection of the creation so far as to believe that whatever curiosity the order of things has awakened in our minds, the order of things can satisfy.

--Ralph Waldo Emerson

The facts will eventually test all our theories, and they form, after all, the only impartial jury to which we can appeal.

--Jean Louis Rodolphe  
Agassiz

Man can learn nothing unless he proceeds from the known to the unknown.

--Claude Bernard

We must never make experiments to confirm our ideas, but simply to control them.

--Claude Bernard

You see things;  
and you say, 'Why?'  
But I dream things that never were;  
and I say, 'Why not?'

--George Bernard Shaw

When you have eliminated the impossible, whatever remains, however improbable,  
must be the truth.

--Sir Arthur Conan Doyle

Theory helps us to bear our ignorance of facts.

--George Santayana

We prove what we want to prove, and the real difficulty is to know what we want to  
prove.

--Emile Auguste Chartier

Order and simplification are the first steps toward the mastery of a subject—the ac-  
tual enemy is the unknown.

--Thomas Mann

In science, all facts, no matter how trivial or banal, enjoy democratic equality.

--Mary McCarthy

Science is built of facts the way a house is built of bricks; but the accumulation of  
facts is no more science than a pile of bricks is a house.

--Henri Poincare

Professors in every branch of the sciences prefer their own theories to truth; the  
reason is that their theories are private property, but truth is common stock.

--Charles Caleb Colton

No theory is good except on condition that one use it to go beyond.

--Andre Gide

On carelessly made or insufficient observations how many fine theories are built up  
which do not bear examination!

--Andre Gide

Hypotheses are only the pieces of scaffolding which are erected round a building during the course of construction, and which are taken away as soon as the edifice is completed.

--Johann Wolfgang von  
Goethe

Theory helps us to bear our ignorance of facts.

--George Santayana

It is the nature of an hypothesis, when once a man has conceived it, that it assimilates every thing to itself as proper nourishment, and, from the first moment of your begetting it, it generally grows the stronger by every thing you see, hear, read, or understand.

--Laurence Sterne

No way of thinking or doing, however ancient, can be trusted without proof.

--Henry David Thoreau

You can prove almost anything with the evidence of a small enough segment of time. How often, in any search for truth, the answer of the minute is positive, the answer of the hour qualified, the answers of the year contradictory!

--Edwin Way Teale

Penetrating so many secrets, we cease to believe in the unknowable. But there it sits nevertheless, calmly licking its chops.

--H. L. Mencken

He who plants a walnut tree expects not to eat of the fruit.

--English Proverb

Vision is the art of seeing things invisible.

--Jonathan Swift

Facts are ventriloquists' dummies. Sitting on a wise man's knee they may be made to utter words of wisdom; elsewhere they say nothing or talk nonsense.

--Aldous Huxley

A fact in itself is nothing. It is valuable only for the idea attached to it, or for the proof which it furnishes.

--Claude Bernard

Get your facts first, and then you can distort them as much as you please.

--Mark Twain

Great discoveries and improvements invariably involve the cooperation of many minds. I may be given credit for having blazed the trail but when I look at the subsequent developments I feel the credit is due to others rather than to myself.

--Alexander Graham Bell

If I have ever made any valuable discoveries, it has been owing more to patient attention, than to any other talent.

--Isaac Newton

Through every rift of discovery some seeming anomaly drops out of the darkness, and falls, as a golden link, into the great chain of order.

--Edwin Hubbel Chapin

What is wanted is not the will to believe but the wish to find out, which is the exact opposite.

--Bertrand Russell

All great discoveries are made by men whose feelings run ahead of their thinking.

--Charles H. Parkhurst

Research: The leading cause of death in rats.

--Unknown

The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day. Never lose a holy curiosity.

--Albert Einstein

From principles is derived probability, but truth or certainty is obtained only from facts.

--Nathaniel Hawthorne

The moment a person forms a theory, his imagination sees in every object only the traits that favor that theory.

--Thomas Jefferson

Research is fundamentally a state of mind involving continual reexamination of doctrines and axioms upon which current thought and action are based. It is, therefore, critical of existing practices.

--Theobald Smith

The path of sound credence is through the thick forest of skepticism.

--George Jean Nathan

The civilized man has a moral obligation to be skeptical, to demand the credentials of all statements that claim to be facts.

--Bergan Evans

It is the nature of an hypothesis, when once a man has conceived it, that it assimilates everything to itself as proper nourishment, and, from the first moment of your begetting it, it generally grows the stronger by everything you see, hear, read, or understand.

--Laurence Sterne

Theory helps us to bear our ignorance of facts.

--George Santayana

The most reckless and treacherous of all theorists is he who professes to let facts speak for themselves, who keeps in the background the part he has played, perhaps unconsciously, in selecting and grouping them, and in suggesting the argument *post hoc ergo propter hoc*.

--Alfred Marshall

There is nothing more horrible than the murder of a beautiful theory by a brutal gang of facts.

--Francois, Duc de La  
Rochefoucauld

The 'testing of hypothesis' is frequently merely a euphemism for obtaining plausible numbers to provide ceremonial adequacy for a theory chosen and defended on *a priori* grounds.

--Harry G. Johnson

Give unqualified assent to no propositions but those the truth of which is so clear and distinct that they cannot be doubted.

--René Descartes

There are two kinds of statistics, the kind you look up and the kind you make up.  
--Rex Stout

A conclusion is the place where you got tired of thinking.  
--Arthur Bloch

The frontiers are not east or west, north or south, but wherever a man fronts a fact.  
--Henry David Thoreau

Let me tell you the secret that has led me to my goal. My strength lies solely in my tenacity.  
--Louis Pasteur

I find that a great part of the information I have was acquired by looking up something else on the way.  
--Franklin P. Adams

The world belongs to the man who is wise enough to change his mind in the presence of facts.  
--Roy L. Smith

Facts do not cease to exist simply because they are ignored.  
--Aldous Huxley

Your ideas cannot become my ideas just because I read them. They become mine when I test them by acting on them.  
--Unknown

Let us work without theorizing; it is the only way to make life endurable.  
--Voltaire

Definition of 'insanity:' doing the same thing over and over, but expecting different results.  
--Albert Einstein

In the world if you are asked to do something and get it wrong, your boss would probably ask, 'Have you checked this with the people around you? How could you reach such a ridiculous conclusion?' If you said, 'no,' you'd be considered incompetent. In school, checking it out with the people next to you is called cheating. Most everything we do in school is the opposite of what we do in the world.  
--Al Shanker

Nothing has such power to broaden the mind as the ability to investigate systematically and truly all that comes under thy observation in life.

--Marcus Aurelius

People see only what they are prepared to see.

--Ralph Waldo Emerson

Were there is an open mind, there will always be a frontier.

--Charles F. Kettering

The only real voyage of discovery consists not in seeking new landscapes, but in having new eyes.

--Marcel Proust

Walking into a meeting of education researchers is like walking into the kitchen of a Chinese restaurant. Everything is cut into small pieces, unrelated to anything else. The visitor wonders what a real meal would be like.

--Edward B. Fiske

What is now proved was once imagined.

--William Blake

That is the true test of a brilliant theory. What first is thought to be wrong is later shown to be obvious.

--Assar Lindbeck

The way to do research is to attack the fact at the point of greatest astonishment.

--Celia Green

If I had thought about it, I wouldn't have done the experiment. The literature was full of examples that said you can't do this.

[On the work that led to the unique adhesives for 3-M's 'Post-it' Notes]

--Spencer Silver

It is a capital mistake to theorize before one has data. Insensibly, one begins to twist facts to suit theories instead of theories to suit facts.

--Sir Arthur Conan Doyle

Facts are not truths; they are not conclusions; they are not even premises, but in the nature and parts of premises. The truth depends on, and is only arrived at, by a legitimate deduction from all the facts which are truly material.

--Samuel Taylor  
Coleridge

Hypothesis is a tool which can cause trouble if not used properly. We must be ready to abandon our hypothesis as soon as it is shown to be inconsistent with the facts.

--William I. B. Beveridge

While playing the part of the detective the investigator follows clues, but having captured his alleged fact, he turns judge and examines the case by means of logically arranged evidence. Both functions are equally essential but they are different.

--William I. B. Beveridge

There must be no barriers for freedom in inquiry. There is no place for dogma in science. The scientist is free, and must be free to ask any question, to doubt any assertion, to seek for any evidence, to correct any errors.

--J. Robert Oppenheimer

It is the theory that decides what can be observed.

--Albert Einstein

Data data everywhere but not a thought to think.

--Theodore Roszak

A few observations and much reasoning lead to error; many observations and a little reasoning to truth.

--Alexis Carrel

The most important of my discoveries have been suggested to me by my failures.

--Sir Humphrey Davy

Research, as the college student will come to know it, is relatively thorough investigation, primarily in libraries, of a properly limited topic, and presentation of the results of this investigation in a carefully organized and documented paper of some length.

--Cecil B. Williams and  
Alan H. Stevenson



What men want is not knowledge, but certainty.

--Bertrand Russell

Get your facts first, and then you can distort 'em as much as you please.

--Mark Twain

People only see what they are prepared to see.

--Ralph Waldo Emerson

Nothing is so simple that it cannot be misunderstood.

—Freeman Teague, Jr.

Whenever man comes up with a better mousetrap, nature immediately comes up with a better mouse.

--James Carswell

One doesn't discover new lands without consenting to lose sight of the shore for a very long time.

--André Gide

We don't know who it was discovered water, but we're pretty sure it wasn't a fish.

—Father John Culkin

Someone said once, 'We don't know who discovered water but we are pretty sure it wasn't a fish!' We are all in this position, being surrounded by some environment or element that blinds us totally; the message of the fish theme is a very important one, and just how to get through to people that way is quite a problem. We have from the moment of birth a fear of the new environment. We always prefer the old one.

—Marshall McLuhan

The reward to working one's way through the known is to find a new question on the other side, formulated in a new way.

--Jerome Bruner

I am the master of everything I can explain.

--Theodore Haecker

It is by logic that we prove, but by intuition that we discover.

--Henri Poincaré

The sky is not less blue because the blind man does not see it.

--Danish Proverb

I could prove God statistically.

--George Gallup, Jr.

If you do not know how to ask the right question, you discover nothing.

—W. Edwards Deming

You should not ask questions without knowledge.

—W. Edwards Deming

The only way to define the limits of the possible is by going beyond them into the impossible.

--Arthur C. Clarke

People call it research nowadays if they ever have to look up anything in a book.

--Margaret Lane

The moment a person forms a theory, his imagination sees, in every object, only the traits which prove that theory.

--Thomas Jefferson

The qualities that scientists measure may have as little relation to the world itself as a telephone number has to its subscriber.

--Frank Rhodes

Observation is a passive science, experimentation an active science.

--Claude Bernard

Nothing in life is to be feared, it is only to be understood.

--Marie Curie

Everything I have ever done is easier than research or writing.

--Fawn M. Brodie

Discoveries are often made by not following instructions, by going off the main road, by trying the untried.

--Frank Tyger

One of the advantages of being disorderly is that one is constantly making exciting discoveries!

--A. A. Milne

A beautiful theory killed by a nasty, ugly little fact.

--Thomas H. Huxley

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

--Louis Pasteur

Never lose a holy curiosity.

--Albert Einstein

It is better to know some of the questions than all of the answers.

--James Thurber

It is easier to perceive error than to find truth, for the former lies on the surface and is easily seen, while the latter lies in the depth, where few are willing to search for it.

--Johann Wolfgang von  
Goethe

The truth is more important than the facts.

--Frank Lloyd Wright

A little experience often upsets a lot of theory.

--S. Parkes Cadman

I never once made a discovery ... I speak without exaggeration that I have constructed three thousand different theories in connection with the electric light ... Yet in only two cases did my experiments prove the truth of my theory.

--Thomas A. Edison

A theory is no more like a fact than a photograph is like a person.

--Ed Howe

In scientific work, those who refuse to go beyond fact rarely get as far as fact.

--Thomas Huxley

Facts are facts and will not disappear on account of your likes.

--Jawaharlal Nehru

In science we are really good at disproving things and are very poor at proving things. Theories like the Theory of Relativity go on and on because no one can think of anything better.

--Richard Zayre

Go around asking a lot of damn-fool questions. Only through curiosity can we discover opportunities.

--Clarence Birdseye

Make it a point to keep on the lookout for novel and interesting ideas that others have used successfully. Your idea has to be original only in its adaptation to the problem you are currently working on.

--Thomas Edison

The mere formulation of a problem is often far more essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities; to regard old problems from a new angle, requires creative imagination and marks real advances in science.

--Albert Einstein

What you discover on your own is always more exciting than what someone else discovers for you—it's like the difference between romantic love and an arranged marriage.

--Terrence Rafferty

Nobel Prize-winning physicist Richard Feynman chided graduate students who would begin work on a problem in a normal way by checking what had already been done. That way, he told them, they would give up the chance of finding something original.

--James Gleick

How dangerous it is to reason from insufficient data.

--Sherlock Holmes

If at first you don't succeed, destroy all evidence that you tried.

--Steven Wright

There are sadistic scientists who hasten to hunt down error instead of establishing the truth.

--Marie Curie

In Japan we have the phrase, 'Shoshin,' which means 'beginner's mind.' Our 'original mind' includes everything within itself. It is always rich and sufficient within itself. This does not mean a closed mind, but actually an empty mind and a ready mind. If your mind is empty, it is always ready for anything. It is open to everything. In the beginner's mind there are many possibilities; in the expert's mind there are few.

--Shunryu Suzuki

Statistics are like a bikini. What they reveal is suggestive, but what they conceal is vital.

--Aaron Levenstein

Men love to wonder, and that is the seed of science.

--Ralph Waldo Emerson

People in general have no notion of the sort and amount of evidence often needed to prove the simplest fact.

--Peter Mere Latham

Innovators and men of genius have almost always been regarded as fools at the beginning (and very often at the end) of their careers.

--Fyodor Mihayloviç  
Dostoyevski

The vast majority of human beings dislike and even actually dread all notions with which they are not familiar....Hence innovators...have generally been persecuted, and always derided as fools and madmen.

--Aldous Huxley

I don't think necessity is the mother of invention—invention, in my opinion, arises directly from idleness, possibly also from laziness. To save oneself trouble.

--Agatha Christie

Familiar things happen, and mankind does not bother about them. It requires a very unusual mind to undertake the analysis of the obvious.

--Whitehead

The improver of knowledge absolutely refuses to acknowledge authority, as such. For him, skepticism is the highest of duties, blind faith the one unpardonable sin.

--Thomas Henry Huxley

By his very success in inventing labor-saving devices, modern man has manufactured an abyss of boredom that only the privileged class in earlier civilizations have ever fathomed.

--Lewis Mumford

One has to look out for engineers—they begin with sewing machines and end up with the atomic bomb.

--Marcel Pagnol

The intention of a theory...is to summarize existing knowledge, to provide an explanation for observed events...and to predict the occurrences of future events.

--Claire Seltiz

An ounce of action is worth a ton of theory.

--Friedrich Engels

The great discoveries are usually obvious.

--Philip Crosby

When I examine myself and my methods of thought, I come to the conclusion that the gift of fantasy has meant more to me than any talent for abstract, positive thinking.

--Albert Einstein

Don't worry about people stealing your ideas. If your ideas are any good, you'll have to ram them down people's throats.

--Howard Aitken

There is no idea, no fact, which could not be vulgarized and presented in a ludicrous light.

--Fyodor Mihayloviç  
Dostoyevski

Only puny secrets need protection. Big discoveries are protected by public incredulity.

--Marshall McLuhan

Invention is the mother of necessities.

--Marshall McLuhan

Unless your ideas are ridiculed by experts, they are worth nothing.

--Reg Revans

The man with a new idea is a crank until the idea succeeds.

--Mark Twain

I'm lazy. But it's the lazy people who invented the wheel and the bicycle because they didn't like walking or carrying things.

--Lech Walesa

If an elderly and distinguished scientist says that something is possible he is almost certainly right, but if he says that it is impossible he is very probably wrong.

--Arthur C. Clark

Everything that IS was once IMAGINED!

--Ted Joans

Personal experience is important in any scholarly activity, but it cannot substitute for scientific research.

--James Cone

There are no recipes. There are no certainties that what I'm doing is going to work. You've got to go on instinct.

--Lou Gerstner

A man of genius makes no mistakes. His errors are the portals of discovery.

--James Joyce

Give me the fruitful error any time, full of seeds, bursting with its own corrections. You can keep your sterile truth for yourself.

--Vilfredo Pareto

He who never made a mistake never made a discovery.

--Samuel Smiles

I invent things when I perceive people's need—it is then a matter of convincing people they need it .

--Sir Clive Sinclair

People go through four stages before any revolutionary development:

1. It's nonsense, don't waste my time.
2. It's interesting, but not important.
3. I always said it was a good idea.
4. I thought of it first.

--Arthur C. Clarke

If there's a way to do it better. . . find it.

--Thomas Alva Edison

Even when all the possible scientific questions have been answered, the problems of life remain completely untouched.

--Ludwig Wittgenstein

'Everything that can be invented already has been.' This statement was released in 1899 by the U.S. Patent Office. If these 'experts' ran the world we would still be sitting in the dark. It is our responsibility to shatter outdated thinking and explore the realm of the untested; it is here that breakthrough opportunities are waiting to be discovered.

—Robert R. Kopp

A great idea is usually original to more than one discoverer. Great ideas come when the world needs them. They surround the world's ignorance and press for admission.

--Austin Phelps

The great scientists, as all great men, have not been concerned with fame. The joy of achievement that comes from finding something new in the universe is by far their greatest joy. A great research scientist is constantly discovering new things in his field. This is his reward. He knows how to spend long years in preparation and long hours in investigation, with no thought of public honor or reward.

--William P. King

Back of ninety-nine out of one hundred assertions that a thing cannot be done is nothing but the unwillingness to do it.

--William Feather

Do not seek to follow in the footsteps of the men of old; seek what they sought.

--Matsuo Basho



Research is the reconnaissance party of industry, roving the unknown territories ahead independently, yet not without purpose, seeing for the first time what all the following world will see a few years hence.

--S. M. Kinter

Look at those cows and remember that the greatest scientists have never discovered how to turn grass into milk.

--Michael I. Pupin

My mother made me a scientist without ever intending to. Every other Jewish mother in Brooklyn would ask her child after school: So? Did you learn anything today? But not my mother. 'Izzy,' she would say, 'did you ask a good question today?' That difference—asking good questions—made me become a scientist.

--Isidor Isaac Rabi

The universe is full of magical things patiently waiting for our wits to grow sharper.

--Eden Phillpotts

The airplane, the atomic bomb and the zipper have cured me of any tendency to state that a thing can't be done.

--R. L. Duffus

The man of science does not discover in order to know; he wants to know in order to discover.

—Alfred North  
Whitehead

I often wish ...that I could rid the world of the tyranny of facts. What are facts but compromises? A fact merely marks the point where we have agreed to let investigation cease.

--Bliss Carman

According to the theory of aerodynamics, as may be readily demonstrated through wind tunnel experiments, the bumblebee is unable to fly. This is because the size, weight and shape of his body in relation to the total wingspread make flying impossible. But the bumblebee, being ignorant of these scientific truths, goes ahead and flies anyway—and makes a little honey every day.

--*Sign in the General  
Motors  
Corporation Plant*

The quickest way to kill a good theory is to put it into practice.

--Evan Esar

The obscure we see eventually, the completely apparent takes longer.

--Edward R. Murrow

For the great enemy of the truth is very often not the lie—deliberate, contrived, and dishonest—but the myth—persistent, persuasive, and unrealistic. Too often we hold fast to the clichés of our forebears. We subject all facts to a prefabricated set of interpretations. We enjoy the comfort of opinions without the discomfort of thought.

--John F. Kennedy

The individual source of the statistics may easily be the weakest link. Harold Cox tells a story of his life as a young man in India. He quoted some statistics to a Judge, an Englishman, and a very good fellow. His friend said, 'Cox, when you are a bit older, you will not quote Indian statistics with that assurance. The Government are very keen on amassing statistics—they collect them, add them, raise them to the nth power, take the cube root and prepare wonderful diagrams. But what you must never forget is that every one of those figures comes in the first instance from the chowty dar [chowkidar] (village watchman), who just puts down what he damn pleases.'

--Josiah Stamp

When the weight of the paperwork equals the weight of the equipment, the project is complete.

--Engineers' Maxim

Every man of genius sees the world at a different angle from his fellows.

--Havelock Ellis

The feeling of 'aha, that's it,' which accompanies the clothing of a situation with meaning, is emotionally very satisfying, and is the major charm of scientific research, of artistic creation, and of the solution of crossword puzzles. It is why the intellectual life is fun.

--Hudson Hoagland

Anything that won't sell, I don't want to invent.

--Thomas A. Edison

Since one must publish to get grants, and promotion in many institutions hinges on the size of the grants, publication and grants rather than discovery become the goals in the laboratory.

--Ernest Borek

Among advocates of any group—black, white or Oriental—social research is welcome only to the degree that it can be used to advance a desired cause.

--Walter Goodman

I am not a great man. I have made a great discovery.

--Sigmund Freud

Averages...seduce us away from minute observation.

--Florence Nightingale

We've taken disturbances and fluctuations and averaged them together to give us comfortable statistics. Our training has been to look for big numbers, important trends, major variances. Yet it is the slight variations—soft-spoken, even whispered at first—that we need to encourage.

--Margaret J. Wheatley

Any fact facing us is not as important as our attitude toward it, for that determines our success or failure.

--Norman Vincent Peale

Benjamin Franklin believed that useful inventions should contribute to the public good, not the the bank account of the inventor.

--Robert R. Potter

If you get all the facts, your judgment can be right; if you don't get all the facts, it can't be right.

--Bernard M. Baruch

The significant problems we face cannot be solved at the same level of thinking we were at when we created them.

--Albert Einstein

Confusion is a word we have invented for an order which is not understood.

--Henry Miller

The way we SEE the problem...IS the problem.

--Stephen Covey

It has recently been discovered that research causes cancer in rats.

--Unknown

If I find 10,000 ways something won't work, I haven't failed.

--Thomas Edison

To every answer you can find a new question.

--Yiddish Proverb

If we are willing to abandon our usual coercive tactics and approach our problems sideways and kitty-corner we stand a good chance of finding our way through some interesting gates.

--Eloise Ristad

So you see!

There's no end

To the things you might know,

Depending how far beyond Zebra you go.

-- Dr. Seuss

Most of the things worth doing in the world had been declared impossible before they were done.

-- Louis D. Brandeis

As long as I can conceive something better than myself, I cannot be easy unless I am striving to bring it into existence or clearing the way for it.

-- George Bernard Shaw

The greatest obstacle to discovering the shape of the earth, the continents, and the ocean was not ignorance but the illusion of knowledge.

--Daniel J. Boorstin

Restlessness and discontent are the first necessities of progress.

--Thomas A. Edison

There are no eternal facts as there are no absolute truths.

--Friedrich Nietzsche

The future is not some place we are going, but one we are creating.

--John Schaar

Once you have the questions right, the answers will come.

--*The Celestine Prophecy*

There are many ways to explore unfamiliar territory: you can go with an experienced guide, you can go by yourself or with others along well marked trails, or you can go alone or with a friend through uncharted territory. Each has its own rewards and drawbacks. If you prefer the uncharted territory, with its rewards and pitfalls, then research may be for you.

--Jon Barwise

An expert is a man who has made all the mistakes, which can be made, in a very narrow field.

--Niels Bohr

In questions of science the authority of a thousand is not worth the humble reasoning of an individual.

--Galileo Galilei

It is the first duty of a hypothesis to be intelligible.

--Thomas Henry Huxley

He uses statistics as a drunken man uses lamp posts—for support rather than illumination.

--Andrew Lang

He who has heard the same thing told by 12,000 eye-witnesses has only 12,000 probabilities, which are equal to one strong probability, which is far from certain.

--Voltaire

If there is an opinion, facts will be found to support it.

--Judy Sproles

Good teaching, effective teaching, is not just about using whatever science says 'usually' works best, it is all about finding out what works best for the individual child and the group of children in front to you.

—Richard Allington

If we knew what it was we were doing, it would not be called research, would it?  
--Albert Einstein

You know you are desperate for an answer when you look at the second page of Google.

—Bill Murray

When faced with a question, half of U.S. consumers would turn to the Internet before trying to remember the answer, according to a Kaspersky Lab report.

— *Kaspersky Lab*

Data should speak to the eyes because they are the best judge of proportion, being able to estimate it with more quickness and accuracy than any other of our organs. A really good data visualization produces form and shape to a number of separate ideas, which are otherwise abstract and unconnected.

—William Playfair

As a child she [Florence Nightingale] was so bewitched by math that she organized information about her gardening in tables. Statistics, she said, were a tool to know ‘the thought of God’: when weary, a glance at a table of numbers was ‘perfectly reviving.’

—Clive Thompson

The ability to ask the right question is more than half the battle of finding the answer.

—Thomas John  
Watson, Sr.

This took place at Boston College during a lecture by a young priest. The professor, after a long discourse, asked for questions. A student arose and demanded documentary proof of various statements made in the lecture. The professor admitted he had no proof with him, although it was easily obtainable. Unabashed, the show-off replied, ‘Well, sir, until you can produce documentary evidence, do you mind if, for the time being, I call you a liar?’

The stunned audience waited for the professor to find his voice. Then he quietly asked the student for his parents’ marriage certificate. Unable to produce, the student sat dumbfounded as the professor said, ‘Well, sir, until you can produce the documentary evidence, would you mind if I called you an impertinent young bastard?’

--Richard K. Malcolm

The amount of verbal pomposity, elaboration of the obvious, repetition, trivia, low-grade statistics, tedious factification, drudging recapitulations of the half-comprehended, and generally inane and laborious junk that one encounters suggests that the thinkers of earlier ages had one decisive advantage over those of today: they could draw on very little research.

--Dwight Macdonald

Play is the highest form of research.

—Albert Einstein

The more thoroughly I conduct scientific research, the more I believe that science excludes atheism.

—Lord Kelvin

Use of the internet opens a world of research and information to students that they would not experience otherwise (and can provide) students with skills such as problem solving and abstract thinking that are requisite for the 21st-century work force.

--Dianne Griffin

No student knows his subject: the most he knows is where and how to find out the things he does not know.

—Woodrow Wilson

Every educated person ought to know when a thing is proved and when it is not proved, should know how to investigate and analyze the proposition which confronts him, and how to search for solutions, how to talk about it effectively before others, and how to contribute to a discussion on problems of joint interest.

—William Norwood  
Brigance

A fool can look at the universe and see nothing, but the right man can look at a pin-point, at a moth, at a cell and guess out the universe. That is the measure of the perceiving mind.

—John Ciardi

Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it.

--Samuel Johnson

Learning to learn is to know how to navigate in a forest of facts, ideas and theories, a proliferation of constantly changing items of knowledge. Learning to learn is to know what to ignore but at the same time not rejecting innovation and research.

--Raymond Queneau

I have seen many phases of life; I have moved in imperial circles, I have been a Minister of State; but if I had to live my life again, I would always remain in my laboratory, for the greatest joy of my life has been to accomplish original scientific work, and, next to that, to lecture to a set of intelligent students.

—Jean-Baptiste Dumas

To me the charm of an encyclopedia is that it knows—and I needn't.

--Francis Yeats-Brown

What single book would one choose to be cast away with on a desert island? My choice would be a *Webster's Unabridged*, that great mother of books, that matrix from which one man delivers *Finnegan's Wake*, another *A Shropshire Lad*. What a glorious prospect—to be alone on an island, with an opportunity to sit back against a banana tree, and read all the way from aardvark to zymurgy!

--Lawrence Clark Powell

Neither is a dictionary a bad book to read. There is no cant in it, no excess of explanation, and it is full of suggestion,—the raw material of possible poems and histories.

--Ralph Waldo Emerson

Small children will have free access to encyclopedic knowledge. Any question that comes to mind, they can explore. Access to knowledge will be like access to air and water.

--Seymour Papert

Google is an Internet search engine used to find Wikipedia articles instead of just going directly to Wikipedia to find them.

—*TL;DR Wikipedia*

The power of computer science lies in augmenting our thinking and in its ability to accelerate research exponentially in other areas. Even areas as diverse as art, economics, medicine and political science can benefit from integrating computational thinking into their research and education. The possibilities are endless.

—Julio M. Ottino



Research is formalized curiosity. It is poking and prying with a purpose. It is a seeking that he who wishes may know the cosmic secrets of the world and they that dwell therein.

—Zora Neal Hurston

The ones who search the most, are the ones who find the most.

—Unknown

A man should look for what is, and not for what he thinks should be.

—Albert Einstein

Successful innovators recognize that discovery of great ideas come from looking at the same thing as everyone else and observing something different.

—Reed Markham

Happy the man who can search out the causes of things.

—Virgil

It's possible to make a more profound contribution to society after you're dead than before. The ability to feel no pain is a kind of superpower that corpses, in the hands of science, can use to help make the world better. Also interesting, especially in military science, is the discomfort around their use in research. Even though they're dead—are bone and tissue and skin now—they still look like people. And we have a natural, if irrational, reluctance to 'harm' them.

—Mary Roach

Fact is not what is; a fact for any person is what he believes is so.

—Arthur Combs

When examining evidence relevant to a given belief, people are inclined to see what they expect to see, and conclude what they expect to conclude. Information that is consistent with our pre-existing beliefs is often accepted at face value, whereas evidence that contradicts them is critically scrutinized and discounted. Our beliefs may thus be less responsive than they should to the implications of new information.

—Thomas Gilovich

Research is continually questioning, answering and more questioning, so that with every experiment and every answer, you have more questions.

—Andrew Chan

Though no one questions the need for research, we often have occasion to question the researcher's interpretation of his findings—and it is often only this interpretation which we hear about in the media. Take, for example, the case of the researcher who spent his life studying the household fly. Using the technique of Pavlov's response, he had taught a fly to jump at the command, 'Jump!' Once the fly could do this unerringly, he removed one of the fly's wings and commanded him to jump—which the fly did, although he was a bit lopsided. He then removed the other wing and commanded the fly to jump, which it did. He then removed one of the fly's legs and commanded the fly to jump, which it again did, although it toppled immediately when it landed. One by one, he removed the second, third, fourth, and fifth legs. Each time, the fly responded to the cry of 'Jump!' by jumping—but each time, he landed with less stability. Finally, the researcher removed the fly's last leg and ordered him to jump. The fly remained motionless. At this point, the researcher wrote into this journal, 'It is strange that when all six of the fly's legs are removed, the fly becomes deaf.'

Do not put your faith in statistics until you have carefully considered what they do not say.

—William W. Watt

Many scholars of the past burrowed into library stacks, read the printed literature on a topic, consulted with a mentor, and emerged with their research. Today, the smartest person in the room is the room. While there are many instances of scholarly collaboration throughout history, none rise to the level of what's possible today, when dozens or scores or hundreds of people from around the world can connect simultaneously and in real time. NYU professor Clay Shirky says that most people 'overestimate the value of access to information and underestimate the value of access to each other.'

—Angela Maiers

The time will come when diligent research over long periods will bring to light things which now lie hidden. A single lifetime, even though entirely devoted to the sky, would not be enough for the investigation of so vast a subject....And so this knowledge will be unfolded only through long successive ages. There will come a time when our descendants will be amazed that we did not know things that are so plain to them...Many discoveries are reserved for ages still to come, when memory of us will have been effaced. Our universe is a sorry little affair unless it has in it something for every age to investigate...Nature does not reveal her mysteries once and for all.

—Seneca (1st Century)

Research is creating new knowledge.

—Neil Armstrong

Before researchers become researchers they should become philosophers. They should consider what the human goal is, what it is that humanity should create. Doctors should first determine at the fundamental level what it is that human beings depend on for life...

Modern scientific agriculture, on the other hand, has no such vision. Research wanders about aimlessly, each researcher seeing just one part of the infinite array of natural factors which affect harvest yields.

Even though it is the same quarter acre, the farmer must grow his crops differently each year in accordance with variations in weather, insect populations, the condition of the soil, and many other natural factors. Nature is everywhere in perpetual motion; conditions are never exactly the same in any two years.

Modern research divides nature into tiny pieces and conducts tests that conform neither with natural law nor with practical experiences. The results are arranged for the convenience of research, not according to the needs of the farmer.

--Masanobu Fukuoka

Doing research on the Web is like using a library assembled piecemeal by pack rats and vandalized nightly.

--Roger Ebert

Advertising people who ignore research are as dangerous as generals who ignore decodes of enemy signals.

—David Ogilvy

I still have my own research library that I have built up over the years, which includes: two complete sets of encyclopedias, as well as huge collections of folklore, poetry, children's books, nonfiction (especially natural history and American and European history), books on writing, art books, cookbooks, biographies of writers, mysteries, science fiction and fantasy, and 19th through 21st century fiction. I haunt old bookstores and go to library sales, *League of Women Voters* sales, antique stores, and garage sales....In the matter of owning books for research, be over-prepared.

—Jane Yolen

Feverish competition in academia coupled with the need to curry favor with colleagues—in order to get published, get tenure, or get grant money—rewards timid research at the expense of maverick undertakings.

—Adrian Currie

Data is just like crude [oil]. It's valuable, but , if unrefined, it cannot really be used. It has to be changed into gas, plastic, chemicals, etc. to create a valuable entity that drives profitable activity; data must be broken down and analyzed for it to have value.

—Michael Palmer

If we look at the amount of data which is actually being analyzed today, only 20 percent of the data we have is searchable and being used productively. The other 80 percent is held inside companies, generally not being used.

—Ginni Rometty

Findings...especially in the social sciences, should be viewed with caution until replicated. The axiom that extraordinary claims demand extraordinary proof clearly applies here.

—Kathleen McAuliffe

Facts are stubborn. You have to accept them the way they are. Science is not about telling people 'I told you so,' it's about different people coming to the same conclusion. It's a collective endeavor. The mistake you cannot make is to judge the past through the eyes of the present. Judge the past on its own terms.

—João Zilhão

You can publish a guideline in a journal, but passive dissemination of information is clearly not adequate for real change.

—Elliot Abt

Not sure that your students get a full picture of the best resources available? Then work with your librarian to create pathfinders, which incorporate research guidance of all sorts: search strategies, relevant call numbers, and help selecting the best Web sites, portals, quality databases, and more.

—Joyce Kasman Valenza

Want help integrating educational technology into your program to engage students and meet curricular and technology standards? Librarians can help you select software, databases, and online resources to meet your curricular needs. We design information systems and create Web sites that lead students to the best resources online. We are expert in the presentation and productivity software that facilitates communication competencies.

—Joyce Kasman Valenza

I've come loaded with statistics, for I've noticed that a man can't prove anything without statistics.

—Mark Twain

School librarians, like most professionals, write for each other and are published in the journals that describe their own field. They similarly present to each other at conferences attended almost exclusively by participants drawn from their own ranks. The result of looking inward—instead of sharing research results where they will be seen by the board members and administrators who could operationalize their findings—has been to cover the light of library contribution.

—Gary Hartzell

There is so much information out there that kids must know how to evaluate and use information ethically. They need to ask better questions. Not to accept information just because it is quick and easy. They need to find the search engines that give the best results. They need to understand that articles in a database are often more reliable than material on a self-published Web site. They have to know how to evaluate the expertise of an author. They need to produce work with their own voices. And just like classification of mammals in biology class, these are skills that have to be taught.

—Sara Kelly Johns

The school librarian is the perfect person to help students and teachers think about the ramifications of technology use. It's because we teach technology differently. From email conversations, to plagiarism, to hacking, to what it means to be a responsible citizen in a wired environment, we focus teachers and students on the ethical uses of education technology. For us, it's not just teaching 'how'; it's teaching 'why'. We teach the process, the transferable skills. We help kids make intellectual connections relating to information—who it belongs to, how to share it, and how to contribute in their own voices.

—Frances Jacobson

The library media specialist is rapidly changing from being an information desert guide—helping learners locate scarce resources—to being an information jungle guide—helping learners evaluate and select resources of value. It's not finding the hidden waterholes anymore, as much as being able to tell the good ones from the bad ones.

—Doug Johnson

Without data, you are just another person with an opinion.

—Andreas Schleicher

As a species, librarians continue to evolve. Our continued evaluation is focused on learning in an information-rich world, on staff development, educational partnerships, constructivist strategies that move students well beyond topical research, ethics, evaluation and searching skills, and new media literacies. The Internet cannot replace libraries. In fact, new technologies make the need for new guidance all the more obvious. Those boxes and wires we put in our classrooms and labs will have little meaning unless information professionals select quality resources for them. The technology itself has little value unless teachers in partnership with librarians help students to effectively and ethically locate, analyze, evaluate, synthesize, and communicate information.

—Joyce Kasman Valenza

An hour spent in the library is worth a month in the laboratory.

—Unknown