Scientific World View

In matters that can be investigated in a scientific way, evidence for the value of a scientific approach is given by the improving ability of scientists to offer reliable explanations and make accurate predictions.

From time to time, major shifts occur in the scientific view of how things work. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Continuity and change are persistent features of science.
ⓘ *Science & decision making*

Science is based on the assumption that the universe is a vast single system in which the basic rules are everywhere the same and that the things and events in the universe occur in consistent patterns that are comprehensible through careful, systematic study.

In science, the testing, revising and occasional discarding of theories, new and old, never ends. This ongoing process leads to a better understanding of how things work in the world but not to absolute truth.

No matter how well one theory fits observations, a new theory might fit them just as well or better, or might fit a wider range of observations.

In the long run, theories are judged by the range of observations they explain, how *well* they explain observations, and how useful they are in making accurate predictions.

Scientists often cannot bring definitive answers to matters of public debate. There may be little reliable data available, or there may not yet be adequate theories to understand the phenomena involved, or the answer may involve comparison of values that lie outside of science.
Science & Society

There are different traditions in science about what is investigated and how, but they all share a commitment to the use of logical arguments based on empirical evidence.
ⓘ *Science & decision making*
Investigations

New ideas in science are limited by the context in which they are conceived; are often rejected by the scientific establishment; sometimes spring from unexpected findings; and usually grow slowly, through contributions from many investigations.

In the short run, new ideas that do not mesh well with mainstream ideas in science often encounter vigorous criticism.
ⓘ *Science & Decision Making*

Science can sometimes be used to inform ethical decisions by identifying the likely consequences of particular actions, but science cannot be used by itself to establish that an actions is moral or immoral.
Science & Society

Scientific knowledge is subject to modification, as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.
ⓘ *Science & decision making*

When similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, and it often takes further studies to decide.
ⓘ *Work of science*
Investigations

Some matters cannot be examined usefully in a scientific way. Among them are matters that by their nature cannot be tested against observations.

Scientific investigations usually involve the collection of relevant data, the use of logical reasoning, and the application of imagination in devising hypotheses and explanations to make sense of the collected data.
ⓘ *Work of science*
Investigations

Sometimes similar investigations give different results because of differences in the things being investigated, the methods used, or the circumstances in which the investigation is carried out, and sometimes just because of uncertainties in observations. It is not always easy to tell which.
ⓘ *Work of science*
Investigations

Sometimes scientists have different explanations for the same set of observations. That usually leads to their making more observations to try to resolve the differences.
ⓘ *Work of science*

Because we expect science investigations that are done the same way to produce the same results, when they do not, it is important to try to figure out why.
Investigations

Science is a process of trying to figure out how the world works by making careful observations and trying to make sense of those observations.
ⓘ *Doing science*

When a science investigation is done the way it was done before, we expect to get a very similar result.
ⓘ *Doing science* Investigations

When a science investigation is done again in a different place, we expect to get a very similar result.

People can often learn about things around them by just observing those things carefully, but sometimes they can learn more by doing something to the things and noting what happens.
ⓘ *Doing science*

limits of science ***investigating a knowable world*** ***continuity and change***

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