

Important Ideas from Playing Card Exercise

1. A basic assumption of science is that there exist knowable natural laws.
2. The objective of science is to seek an understanding of natural laws.
3. The hypothesis (and conclusion) that events/phenomena are random or chaos is a last resort.
4. The less understanding or the fewer observations that we have on the system, the less prepared we are to offer hypotheses.
5. It is important to understand and identify clearly our assumptions, since our hypotheses, and thus our conclusions, will be limited by the assumptions we make.
6. It is important to identify as many competing hypotheses as possible.
7. It is important to make predictions for each hypothesis that will accommodate every possible test outcome.
8. It is important to state hypotheses very clearly.
9. Some tests will not discriminate among competing hypotheses.
10. Some tests will not provide any evidence on some hypotheses.
11. Our perceptions (measurements) of the evidence may influence our interpretation of results.

12. 'Ad hoc' hypotheses that simply identify the specific pattern seen so far are of little value.
13. Larger sample sizes provide a better test than smaller sample sizes.
14. Different researchers may get different results based on the data and experiment they conduct; final interpretation must take into account all evidence.
15. It is important to record the data accurately.
16. Further tests are often necessary to discriminate among unfalsified hypotheses.
17. It is possible to get predicted results from incorrect hypotheses.
18. It is possible for two patterns to be controlling the same phenomenon.
19. A chaos or random universe may appear ordered in a sub-set.
20. Science cannot prove hypotheses correct, but can falsify hypotheses.
21. Science does not lead to certainty or the determination of truth.
22. Theories are hypotheses that have been tested repeatedly and not falsified.
23. Repetition is essential to increasing confidence in scientific discoveries.