

Basic SCIENCE LEARNINGS

Essential to Children and Youth

Science learnings play an indispensable part in children's growth as they develop an understanding of the world in which they live.

BY THE PHRASE, "basic science learnings essential to children and youth" is meant science learnings necessary to successful present day living. Successful living for the individual may be defined as satisfactory interaction between that individual and the many, many factors in his environment.

We are made by our environment as we in turn attempt to make our environment over to suit our needs. Our ability to control the environment grows as we get additional understanding of it. We get additional understanding as we grow in ability to exert these controls. It seems that understandings or information and successful interaction involving control are parts of the same cycle.

For the little child this cycle of understandings and control is a small one, while for the successful adult it is relatively large. Our problem, as teachers of children, is one of helping each of them to make satisfactory growth in widening his cycle of successful interaction with his environment. This

growth does not involve just content or just interaction. It calls for both. It seems that one gets either growth in both or in neither.

The reader will keep in mind the fact that the writer of this report was asked to deal with basic learnings essential to children and youth. Space permits only an indication of some areas in which it is thought that each child should make annual growth. It is hoped that the teacher believes that satisfactory development for each child is dependent on what happens to him from the "inside out" as he deals with basic learnings or content.

Each child brings to the classroom a unique background of understanding and abilities. The growth made by each will be in terms of the ways in which new content impinges on his background, giving rise to enlarged or new understanding from within. Just as each child brings a unique background, each will undergo a unique development. Thus in dealing with basic learnings it seems appropriate for the teacher to think of them as directions in which an annual growth of understanding should occur. Each child should each year gain knowledge of many phases of his natural and physical environment.

The elementary school teacher must

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be concerned with the development of all of the children. He does not teach science for the purpose of making scientists of some of the children. This would be neither feasible nor desirable, even if he taught only a few children and knew that they were going to become scientists. The elementary teacher is not qualified to do it and it is not what the children need. Each child needs the opportunity to grow in developing understandings in many directions, not one to specialize in a few.

Children Should Each Year Grow in the Ability To Understand Themselves: Successful living for the individual is enhanced by an understanding of the nature of his body, the ways in which different parts of it function, and the changes it is undergoing. The maintenance of good health calls for an adequate diet, plenty of rest, proper clothing and shelter, a balance of physical activities, and the use of proper precautions with regard to communicable diseases.

The process, science as a way of learning, living and working, is an essential part of science content for children. It is not suggested that they can learn everything they need to know by planning experiments in which they can discover it for themselves. However, it is contended that they should have many opportunities to grow in understanding themselves as creatures capable of controlling their environment. This they can do by planning and carrying through experiments in which they can make discoveries.

Our adult society has a need for many types of interests, skills and prod-

ucts. Thus it would seem important that teachers increase the extent to which they place the stamp of approval on successful achievement in many directions. It is not suggested that they de-emphasize the importance of activities calling for the use of reading and number skills, but that they emphasize many other accomplishments as well.

Science, as a part of the educational program, affords unique opportunities for varied types of teaching. This means that in science teaching, there can be opportunities for each child to find areas in which he can excel, thus having a feeling of successful achievement. It also means there can be such a variety of experiences that no one child will always excel in all types.

An ability to understand themselves in relation to other people, is a basic learning that should grow out of children's science experiences. Science experiences provide children many opportunities to work in cooperation with their peers, giving and getting ideas as they find solutions to problems of significance to themselves. Thus they come to see the value of working with others in arriving at mutually desirable goals.

Children Should Each Year Grow in an Understanding of Living Things: The number of different kinds of plants and animals is almost infinite. Individuals of each kind differ from others, even of the same kind. Many types of plants and animals that lived in the past are now extinct. Some living things of today are much like those of long ago, while other kinds are much different from any that lived in the past.

Each kind of plant or animal lives in an environment that is suited to it. It is able to survive changes in its environment only if its body can adapt successfully to the different conditions. With the exception of man, creatures are not able to plan changes in their environment. Each form of life, including man, is dependent on many other forms for survival.

We can grow the plants and animals we need in many places where they could not live without our help. We, through science, develop plants and animals that can live in places where we need them. We are able to plan what we need insofar as types of plants and animals are concerned and then to make progress in developing these.

Children Should Each Year Grow in Understanding the Earth: All of our material needs are met by the use of products from the earth and its atmosphere plus the energy from the sun. Food, clothing, shelter, water, fuel for heat and work energy, and the substances of which all of our mechanical devices are made come from the earth. Everyone has a vital stake in the wise utilization of the earth's resources of fuels, minerals, soil and water. Waste of these resources results in lowering the standard of living of present and future generations.

Changes continually occur in and on the surface of the earth. Some of these changes, such as those manifested in earthquakes and volcanic action, will be less frightening to children as they learn that man understands these phenomena. As children come to know that these phenomena are due to gravitation and other natural forces,

they get additional security. Gradual changes, such as some types of erosion may not seem frightening. However, they may be much more dangerous to our present and future security. Thus it is well for us to help children become concerned and informed about these types of changes.

The atmosphere, as a part of the earth, is the vehicle that brings our weather. Each of us is vitally affected by it every day. Understandings of the weather help us to determine what are appropriate homes, proper food and adequate clothing for the place where we live. Understanding about the weather is important to the farmer, horticulturist, aviator, resort owner and many others. Weather predictions and storm forecasts are responsible for saving hundreds of lives and millions of dollars worth of property each year.

Children Should Each Year Grow in an Understanding of the Nature of Substances: What anything is at the moment depends on what it was to start with and what has happened to it. This is as true of the children in our classrooms as of the materials with which we work. Every new product is a result of changes in and/or combinations of other substances. In other words, everything that we have is made from something else.

Our ability to have what we want is limited by the extent to which we understand the materials around us. What for one generation may be heavy dirty rocks may become the minerals from which another gets valuable metals. Good farm land is valuable to the extent that we know how to grow

and use appropriate crops. Harvests of beef, fish, fruit, grain, pork or wood increase in value as we learn more about how to preserve, transport and use them. Resources of coal, gas and oil are useful to the extent that we know how to get them from the earth and bring about changes that give us energy and needed products.

Children Should Each Year Grow in an Understanding of the Universe: Knowledge enables people to take a common sense attitude, eliminating control through superstition or fear of the unknown. There is security in the knowledge that some people understand the forces of the universe, even for the person who does not understand them himself.

Children should be helped in developing a realistic concept of time. It seems that an attitude of unconcern for the wise utilization of natural resources is fostered by the belief that the world is short lived. An idea that the earth is very young seems to go along with the one that it is likely to come to an end tomorrow. The individual who momentarily expects the end of the earth can hardly take a realistic attitude toward planning for either present or future generations.

Children may reasonably be frightened when they come to think of the earth as an object hurtling along through space at a velocity of thousands of miles per hour. Teachers, being concerned for their stability, will help them to understand that the earth has been pretty much as it is for a long, long time and that there is every reason for assuming that it will continue for a long, long time.

Children Should Each Year Grow in Understanding the Ways in Which We Control and Use Our Energy Resources: As we increase our ability to utilize the energy resources of the earth we become less dependent on the energy of manpower and of beasts of burden. We can buy for a few cents an amount of work energy equivalent to what a man can produce in a day. For example, it would take ten men working steadily to produce the energy needed to keep four 250-watt bulbs lighted. We buy the electrical energy equivalent to ten man hours, one kilowatt hour, for a few cents.

Electricity is a convenient way of transforming and transferring energy. The electrical power plant changes the energy of fuel or running water into controlled mechanical energy. This controlled mechanical energy is transformed into electricity, which can be transferred over wires to places where it is needed. Then the electrical energy is transformed back into mechanical energy to run motors or into energy of heat, light or sound. We continue to gain in ability to control large quantities of energy with small exertion on our part. In the power plant, mentioned above, one man may control an amount of work energy equivalent to that of millions of men.

We may think of engines as devices with which we change the potential energy of fuels into kinetic energy of motion. Engines enable us to get work from coal, oil and gas. A two-hundred-horsepower automobile engine, working at its rated capacity does an amount of work equivalent to that of fourteen-hundred men, working for the same period.

Children Should Each Year Grow in an Understanding of the Extent to Which We Are Dependent on the Intelligent Cooperation of Many People: As we gain in ability to control the energy of the universe, we increase the extent to which we can make our environment over to suit our needs. Transportation by airplane, automobile, ship and train becomes faster, more comfortable and safer. Communication systems, including the radio, telephone and television bring us daily closer to people in all parts of the world. Understandings of food production, preservation and transportation enable us to have what we want and need wherever we are. However, as new developments give us more independence of our natural environment, they make us more dependent on the intelligence of others.

Complicated technological gadgets are useful only to the extent that there are experts to build, repair, service and, in some cases, operate them. For example, we may in a few days drive to any part of our country. We take for granted the fact that filling stations are located at convenient intervals along the highway and that we will be able to buy gasoline, get minor repairs and road information just about any time we need to. An almost infinite number of people have played a part in making it possible for us to take the trip. Literally millions of people are involved in the many activities necessary to bring about a situation such that we can drive wherever we please. It seems that as we gain in ability to control the energy resources of the earth we become more dependent on the "know how" of others.



National Training Laboratory in Group Development

The National Training Laboratory in Group Development will hold two three-week summer laboratory sessions at Gould Academy, Bethel, Maine. The dates will be from June 19 through July 8 and from July 17 through August 5.

Approximately 125 applicants will be accepted for each of these two sessions. Persons involved in problems of working with groups in a training, consultant, or leadership capacity in any field are invited to apply.

The training program is organized so that each trainee group is enabled to use its own experience as a laboratory example of group development. Group skills of analysis and leadership are practiced through the use of role-playing and observer techniques.

A special project concerned with the development of understandings and skills of human relations training will be instituted this year for a selected group of delegates.

The Laboratory research program in group behavior and training methods is an important part of the training, and the use of research tools which are within the range of the Laboratory training program is incorporated into the curriculum.

The NTLGD is sponsored by the Division of Adult Education Service of the NEA and by the Research Center for Group Dynamics of the University of Michigan, with the cooperation of faculty members from many other leading educational institutions.

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